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Vol. 23

**APRIL, 1937** 

Number 4

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### THE AMERICAN MINING CONGRESS

309 Munsey Bldg., Washington, D. C.

Howard I. Young, President David D. Moffat, Vice President

Edward B. Greene, Vice President Donald A. Callahan, Vice President Julian D. Conover, Secretary

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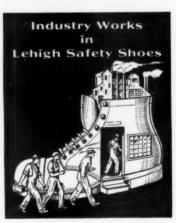
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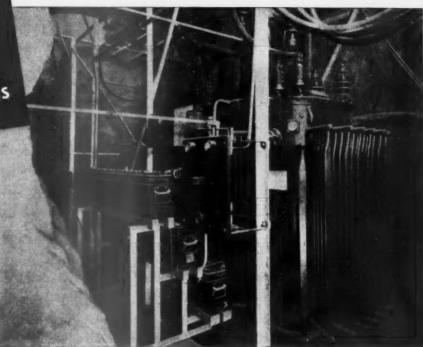
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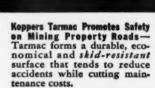
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From December, 1936, Model Mining Issue of COAL AGE, p. 569

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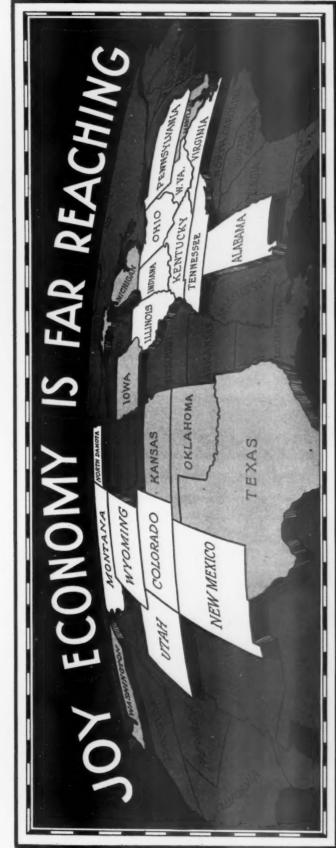
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THE MINING CONGRESS JOURNAL

### Blind Leaders of the Blind

OW that many of the great employing industries have recognized the unions of organized labor, it may be well to consider what this means to the consumer and what, in the end, it may mean to wage earners.

It will be conceded that all wages in the end must come from production and that all production costs must be passed on to the consumer.

It is not the purpose of this editorial to discuss the rights and wrongs of the present situation, but rather to discuss the ultimate results of the present policy and to show that the involved violations of the individual right of contract will work hardship upon those who now feel that a great victory has been accomplished.

No problem is ever settled until it is settled right.

The raising of wages in the steel industry was accompanied by a raise in the price of steel, supposedly large enough to cover the cost of the wage increase. Five dollars per ton increase in the cost of steel, and similar increases in costs of other building material, means an increase in rents, not only for the newly constructed buildings but in all the buildings now occupied by tenants.

This same illustration will apply to all industrial production.

Increased rents and increased living costs call for increased wages, and so we travel around the spiral of increasing price levels and increasing living costs. These in turn induce increased speculation (more easy now than ever before because of the tendency toward dangerous inflation) and to panic, business depression, unemployment, want and despair.

Who will feel most keenly the burden of such a result? He who never saves for a rainy day; he who depends upon others for employment; the wage earner.

This is not all: increased price levels impair the benefits of tariff protection and not only keep our goods out of foreign markets but open the door for imports of goods produced by workmen in foreign countries, thus adding to the domestic unemployment problem.

And the wage earners of America, led by men who are forcing increases in the wage level, are joyfully—yes, triumphantly—marching into a wilderness where animosity and hate will vie with hunger and despair, and where sit-down strikers will be succeeded by involuntary idleness.

This has been the rule in the past, where each cycle was more disastrous than its predecessor, and if the lamp of experience is any guide this will be the certain result of the present exhibition of the blind leading the blind.

St Gelbrath



Vol. 23

**APRIL. 1937** 

Number 4

E. R. COOMBES, Editor

### A Journal for the entire mining industry published by The American Mining Congress

### An All-Important Subject

WHETHER VIEWED from the humanitarian, dollars-and-cents, or efficiency standpoint, safety remains one of the most vital items affecting industry.

In 1907 the American Mining Congress began an active campaign to reduce mine accidents. From that time to the present it has not lessened its interest and activities. From the creation of the United States Bureau of Mines—a major function of which is the promotion of safety-to the establishment of its Operating Committees, studying safe and efficient mining methods, this organization has continuously kept Safety in the forefront. The results that have been achieved during these years are important and in a sense gratifying. But the goal is far from in sight. Much remains to be done. Many factors are involved: Number 1 seems to be education from the highest executive to the lowliest worker. The articles presented in this issue, by men from many branches of mining and State and Federal Government, stress education and still more education, and the presentation of old commonly accepted safety principles in new guises; Number 2 factor is the adoption of rigidly enforced safety programs, with a man in charge whose sole and only duty is safety. The third is the necessity for the use of protective clothing; new and safe methods of doing regular jobs; and last, first, and forever—vigilance, intensive training, and intelligent cooperative action by mining officials.

Unquestionably the prevention of mine accidents constitutes a major mining problem, the solution of which is well worth the best effort of all persons in responsible charge of mining work. All of us rejoice that mine explosion disasters with wholesale loss of life have occurred far less frequently in the past 4 years than in any other similar period of our mining history in at least the past 50 years. With equal certainty, none of us would like to revert to conditions as to mine disaster occurrence of 5, 10, 15, or more years ago. Likewise we all rejoice in the downward trend of mine accident rates (including all types of accidents) revealed during the past four or five years, and hope that the downward trend will not only be continued but materially accelerated.

There are in this country approximately 9,600 mines of all classes—coal, metal, and miscellaneous groups. Of this number by far the larger percentage of the big producers are safety-conscious, have established safety

organizations, and are doing splendid work in reducing accidents. These men are certainly not proud of the record of the industry as a whole, which ranks mining as the second most hazardous industry. They are cooperating with the United States Bureau of Mines, the National Safety Council, the American Mining Congress, and with their state and local organizations to bring the mining record in the "safe industry" class.

The Bureau of Mines and all other agencies working in behalf of mine safety need cooperation. It is more than essential that management shall take more than a passive interest in safety programs. The industry should make safety its first principle. Safety saves human lives; it saves dollars and cents; it establishes efficiency. A well-planned safety program is the duty of every mine.

### Valuable Statistics

IT IS DEPLORABLE that the United States Bureau of Mines, in common with other Government statistic-gathering agencies, should encounter such a lack of interest in and indifference to its work of assembling statistical information for safety reference work on employment, man-hours of exposure, injuries, explosives, cutting machines, loading machines and mining methods. The excellent reports of the Bureau constitute a base upon which each mining operation may judge as to its own performance in reducing accident hazards. Because of the delay on the part of mining managements in furnishing the information, many of these valuable reports are two years late in reaching the industry.

During the years of low production the good work done in the reduction of injuries to workmen is a source of genuine gratification. With increased production has come the accompanying danger that our good records on safety precaution may suffer and that in the striving for ever increasing tonnage the efforts of the past in

safety may not be maintained.

The work of the Bureau is the back-log, the firm rock upon which we may depend and to which we may refer as a base in our consideration of safety performance. Under the work load which we now carry, the managements of mining industries must not forget the importance of cooperation in furnishing promptly the data requested.

### What the Record Shows

IN THE PAST 148 years some 24,902 public laws have been passed by the Congress of the United States. Of this number, and in the same period, the Supreme Court has declared only 73 unconstitutional.

That is an amazing record. Yet today the Court is the subject of a national controversy. Serious recommendations are being made that either the Supreme Court or the Constitution must be changed.

The United States News gives some pertinent facts concerning this situation when they point out that "during 144 years the Supreme Court found 61 legislative Acts of Congress or parts of them to be in conflict with the Constitution. But during the last four years the Court has found 12 to be in conflict \* \* \*; out of the 16 Supreme Court decisions that bore on economic and social problems, eight were decided in 144 years, and eight were decided in the last two years."

Let us look at the vetoed Acts that have precipitated the present discussion. The Court ruled adversely upon:

Conversion of building and loan associations to Federal charters.

A moratorium on farm mortgages.
Payment of railroad pensions.

Municipal Bankruptey Act.
"Hot Oil" Law for Petroleum Industry.

The Law creating the National Industrial Recovery Act.

The Agricultural Adjustment Administration. The Guffey Coal Act.

The Supreme Court has been increased before. If, as the President states, there is an emergency and important decisions are being held up for want of personnel to consider them, due considerations should be given that fact. On the other hand many insist that there is no emergency and that there can be no justification in "packing" the Supreme Court, a court of justice.

The country has long prospered under the system developed by our forefathers: the legislative—the executive—the judicial, a triple check upon unwise or hasty proposals. Before we change this plan, the people of the United States are entitled to the fullest debate and enlightenment. We are standing on the threshold of Tomorrow, and it is well for us to consider fully the quality of that Tomorrow as affected by our actions today.

### The Rewards of Industry

A RECENT issue of "LIBERTY" carried an editorial entitled "To Hell with Capital." It pointed out that this is a government of free people, and that it, for one, was willing to abide by the will of the majority: if the majority agreed that this country should say "to hell with capital," well and good. But . . . and the "but" is all-important: Capital cannot be dismissed so summarily. It is entitled to its day in court. Capital, as such, during the life of this country has made possible the finest working standards of any nation at any time in the world's history. It has provided the workers with the wherewithal for homes, automobiles, conveniences of all sorts; and it has made America. . . America!

There are some who believe that capital has been greedy. There are those who believe that there has not been a satisfactory distribution of the earned dollar.

They may be right. But what is capital? Your money and mine, invested in enterprises that have proved their efficiency and merit. The workers of today, in this country, may become the capitalists of tomorrow. In the present labor disturbances the men who have met and agreed have not been "born to wealth." B. F. Fairless, of the Carnegie-Illinois Steel Corporation, started from scratch; John L. Lewis started as a day laborer; William Knudsen, of General Motors, was a shopman. United States history is replete with their examples. The same men so efficiently running business today are unquestionably the same men who would be hired to run the business if all industry were turned over to government conduct.

We cannot adopt a "to hell" with capital or with labor policy without spelling defeat for all of those things we as a Nation hold sacred. Necessity has always been the nest from which our mightiest have flown. In our closeness to the privations of the past few years let us not lose sight of the fundamental principles that have given every man an Opportunity.

### The Week of May Seventeenth

THE COAL INDUSTRY, as usual, is well in the limelight. What with the Guffey-Vinson bill, the negotiations for a wage scale for the Appalachian group, the talk of strikes, and last but by no means least, the big coal convention and exposition rapidly emerging from its embryo state, the industry constantly "makes the headlines." Whatever the outcome of the coal control bill or the wage negotiations, one fact remains unchanged—the convention and exposition to be staged at Cincinnati during the week of May 17 will be greater than ever.

Whatever besets the industry, interest never lags in the establishment of safety and efficiency in production methods. Hundreds of individuals are cooperating with the American Mining Congress and its Manufacturers Division in the development of a program of papers on operating subjects and an exposition that will present the latest improved devices for efficient production. These meetings—joint groups representing the men who use and the men who make mine equipment—have become the outstanding event of the year for the coal Industry. Nineteen thirty-six set a record hard to beat, but everything indicates that the industry is very definitely looking ahead to this meeting, and planning on participation. They will come away enriched. Coal of tomorrow will be the topic uppermost considered, and the men present will be the men who will guide the future of the industry.

### The Copper Industry

THE RAPID RECOVERY of copper from the position in which it found itself a year ago is gratifying. The copper trade has weathered six long years of depression when it "took it on the chin"—and came through. Copper is selling at improved prices and the increase is an entirely natural one. It has not been a case of producers increasing their prices; rather it has been brought about by the buying demand. Copper enters into an ever-increasing number of industrial pursuits, from rainspouts to copper cables. The Copper and Brass Institute, supported by the leading producers, has done much to increase the markets for the industry. New uses and increased demand in old uses have put the industry back in line as a number one national asset.



## What's Wrong With Mine Safety Programs\*

By D. HARRINGTON !

E Americans pride ourselves that ours is the greatest, most advanced, and most civilized nation in the world, yet statistics indicate that apparently we have little appreciation for the lives and limbs of the people whose efforts give us whatever greatness The latest available stawe possess. tistics indicate that the annual accident death rate per 100,000 of population is nearly 80, or far higher than that of any other country in the world except Chile: is more than double the rate in Hungary, Netherlands, Ireland, Belgium, Den-mark, Italy, Germany, Norway, Sweden, and Finland; is nearly double that of England, Wales, the Union of South Africa, New Zealand, Japan, Australia, and Scotland; and is 25 to 40 per cent greater than Switzerland, France, and Canada. To make matters worse, from the viewpoint of mining, the latest available statistics give mining by all odds the worst accident rate of the major industrial occupations in the United States, the accident severity rate for mining in 1935 being listed by the National Safety Council as 10.14, the next highest rate being 4.52 for construction, and the average rate for 30 main industries being 1.58.

Offsetting to a slight extent this rather dark picture is the fact that starting about 1930, the mine accident rate in

### SAFETY RULES-ENFORCED-REDUCE ACCIDENTS

Our company has in the past 18 months put into effect safety rules which are very few in number but which we feel have been of help in the prevention of accidents.

There is one rule in particular which has done a great deal in bringing to the minds of our employes the thought that they should be careful at all times. This particular rule reads as follows:

"It shall be the duty of every one in the employ of this company when approached or approaching anyone to call out BE CAREFUL."

In addition to calling out BE CAREFUL the miner at the working face must sound his top and ribs. We have substituted BE CAREFUL for the conventional "hello" or "good morning" and we use this not only inside but outside our mines as well, and it keeps in the minds of our employes the thought that they should always BE CAREFUL and not do anything that might injure themselves or their fellow-workers and all their work to be practiced in a safe manner. We find our miners have responded 100 percent in practicing this rule and enjoy the saying of BE CAREFUL, for they realize it has been of assistance in reminding them to practice carefulness and safety.

Also, in addition to the BE CAREFUL rule we have safety banquets every three months and these are attended by everyone in our supervisory force. We also include the heads of the stores department personnel and our doctors. We discuss the accidents that have occurred, how they happened and how they may be prevented in future. These banquets have helped reduce and prevent accidents.

We also plan on putting in bulletin boards with illustrations of accidents and how they occur, and these bulletins will be changed from week to week and we hope that this will be of some benefit also in the prevention of accidents and the promotion of safety.

R. E. Salvati,

General Manager,
Island Creek Coal Co.

Improvement in the copper industry during the past few years has been followed by an increase in the number of men employed. As a large proportion of these men were new to the company and many had never before worked underground, a somewhat new safety problem was presented in that it became necessary to teach them early in their employment that safety was one of the most important factors in their daily work.

To attain this end, several methods are followed:

A book of safety rules is issued to each new employe by the employment agent, and the importance of safety is made clear to him.

Before going underground, he is required to attend a lecture by the safety inspector, who gives a short talk on working conditions and mining methods.

Blasting, trimming down loose ground, handling of tools and equipment, and various other operations are discussed. When in doubt as to proper procedure, the new man is

advised to take no chances but to get further instruction before going ahead.

Several days each week, during the noon hour, the inspector talks to some group underground. He points out any unsafe conditions or practices he may have observed during his morning inspections, discusses an accident that might have occurred recently, and invites questions and suggestions. If time permits, a short examination on safety rules is held.

Another and important method is the placing of the new man with an old employe until he is well broken in.

The effectiveness of these measures is shown by the new employes' knowledge of the working rules and the interest taken in accident prevention. Several good safety suggestions have been offered by new men.

P. G. Beckett,

Vice President, Phelps Dodge Corporation.

both coal and metal mining began to fall, reaching an all-time "low" in metal mining in 1932 and in coal mining in 1933. It now appears probable that the year 1936 has again lowered the accident rate in coal mining, and this, together with the fact that the years 1933, 1934, 1935, and 1936 all set much lower accident rates in coal mining than were achieved for any similar previous period, gives hope that the trend is definitely in the right direction, though from the above figures mine-accident severity has a long, tedious road to travel before it becomes as low as the severity rate of all other major industries in the United States

Fatalists who believe that mining is so inherently unsafe that it can't be made safe, that "what is to be will be" and that it is waste effort to try to take preventive measures, as well as other pessimistic followers of the idea that mining must always occupy the booby place in accident prevention, might "get away" with their do-nothing or stand-pat attitude if it were not for the fact that there are scores of well-authenticated instances of long-time operation of mines, coal as well as noncoal, with accident occurrence (including severity as well as frequency rates) little if any poorer than those attained by other so-called hazardous industrial pursuits. We now know of scores of mines, surface and underground, coal and noncoal, that have operated one or more years without a single lost-time accident; of scores of mines of practically all types that have operated for several years and produced heavy tonnages of coal or rock without a fatality; of underground workers who have escaped accidents in 30, 40, 50, or more years of work in and around mines, coal as well as noncoal; of mines which by really well-directed effort have reduced accident occurrence, including not only

frequency and severity but also the dollars-and-cents costs of accidents, 75 to 90 or more per cent in less than a 5-year period; in fact, we KNOW beyond the shadow of a doubt that mines can be operated with a high degree of safety, provided the will to do it plus the exercise of the required amount of continued, well-directed effort, is made by those engaged in mining, with particular reference to those in supervisory and ownership positions.

ownership positions.

Responsibility for accidents in and around mines rests primarily on the owner or operator; this is true not only from the humanitarian, but to even a larger extent, from the legal point of view. The various state laws require the industrial organization (the mine operator in this case) to compensate the accident victim or his dependents as well as to provide largely if not wholly for medical aid, hospitalization, and in some cases funeral charges; those financial outlays constitute the socalled direct cost of accidents. Of course, the indirect costs (said by some authorities to be at least four times as great as the direct costs) rest almost wholly on the employer. The combined direct and indirect costs of accident occurrence in mining are now believed to amount to 10 or more per cent of the cost of mining and by a reasonable amount of well-directed, consistently-applied effort, chiefly by and through the employer



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and his agents, this cost can readily be reduced by 75 or more per cent. Admittedly the responsibility for accident occurrence as well as for engineering and administrative measures for its reduction is a most difficult one for the mine operator. Fulfillment of the obligation to hold accident occurrence to a minimum requires utmost tact, ingenuity, and persistence on the part of the mine officials, necessitating direction and control over numerous conditions and agencies susceptible of such direction and control only by use of the highest type of technical knowledge and experience plus a continuous broad-gauge policy of dealing with men.

Probably the worst handicap today to getting effective results in the prevention of accidents in mines is the difficulty of enlisting the active personal interest of the "man higher up" in the prevention of accidents; and unless or until the "higher-ups" become sincerely interested and personally active in promoting safety in mining, our mine safety achievements are likely to make little progress. If the operating heads, including president, general manager, general superintendent, and superintendent, devote a reasonable amount of personal time and sincere, common-sense effort toward promoting safety, the "job" of the lower mining officials, including the safety man or men, in "putting over" safety requirements is very greatly aided. On the other hand, the very worst influence to be found in trying to "put across" a mine safety program is the higher official (president, vice president, general manager, etc.) who "once in a blue moon" attends a safety meeting and then pro-ceeds to lambast his employes about some controversial subject, aligned to safety indirectly if at all, such as hours of work, wage rates, cleaning coal, etc. Management now pays most of the bill for accidents; nevertheless, the worker usually not only endures the pain and kindred handicaps and sorrows, but also in the long run suffers far more financial loss than is usually believed; and the wise, up-to-date management (as individual members or as a whole) can do far more than any other agency in forwarding safety. Without sincere interest and support from management, the work of subordinate officials (including the safety engineer) is sadly handicapped and in many cases made essentially useless in progress or accomplishment.

Certainly the managerial force of any mining property cannot expect to "get anywhere" with a new or even partly new safety program unless it puts its own house in order before trying to introduce changes, even those looking to greater safety, that affect to any considerable extent the employes' usual routine. Before trying to place a comprehensive safety program in effect, a wise, farseeing mine management will demonstrate its own sincerity by exerting a reasonable amount of effort to make operating conditions, equipment, and methods such that when pressure is put on the worker later to conform to inno-

### THE POWER OF SUGGESTIONS

Practically every appropriate mechanical safety device has been put into use at the United States Potash Company's mine near Carlsbad, N. Mex., in an effort to prevent accidents. Hard-boiled hats, hard-boiled shoes, and hard-boiled rules; goggles, safety belts, and other safety equipment all helped. But these were not sufficient to give the desired results.

A safety educational program was inaugurated, with first aid training, safety talks, bulletins, posters, etc. The best results were obtained by encouraging the men to offer suggestions as to how to prevent accidents or

It is evident that when a man thinks of some means of preventing an accident, he goes through a process of thinking along safety lines, touching considerably more territory than is actually shown by the suggestion itself. In many instances he may have to study an entire operation to arrive at the correction of one small detail. Because of this, the company not only receives suggestions that actually do prevent accidents, but also succeeds in getting the men to think safety. This, after all, is the important thing in a safety program.

Each department and each shift has periodical meetings devoted entirely to the presentation of safety suggestions by the men. The suggestions received at these meetings, if accepted by the supervisors, are posted with the names of the employes making them, and are put into effect immediately. If a suggestion is not practical, it is returned to the man personally, by the safety engineer, with a full explanation as to why it cannot be used. It is surprising how few of the suggestions are impractical.

C. A. Pierce,

Gen'l Supt. of Mining Operations,
United States Potash Co.

### ANALYZING SAFETY RESULTS

To better a safety record I believe there is no better way than the analytical method. Using this method, the management knows each month just what is being done. Each face boss receives a record as to the standing in his section covering number of accidents, number of lost days, total cost to the company, and tons of coal loaded per compensable accident.

Such a record will indicate to each face boss just how he stands as compared to the rest of the management. This record furnishes not only the standing for the month, but also the accumulated standing for the year as compared to the other face bosses, as well as the mine manager, superintendent, top boss and mechanical supervisors. This individual record, therefore, tends to create a competitive interest in keeping down the number of accidents and the cost.

The face boss is responsible for accidents occurring to all men in his section, from the face to the parting; the mine manager for all men engaged in transportation, caging, pumping, ventilation, etc.; the top boss being responsible for all men employed on top. The head of the mechanical department is responsible for all men employed on the maintenance and installation of electrical and mechanical equipment above and below ground, and the superintendent for all injuries which result from bad practices that are permitted to exist.

The record which is published monthly acts as an incentive to the officials to keep their records clear, since it places responsibility for the safety of all men employed, upon certain definite supervisors, who realize that the management can as readily determine not only the individual responsible for poor safety performance, but note those also displaying the greater efficiency.

W. J. Jenkins,
President,
The Consolidated Coal Co.

### PROTECTIVE CLOTHING SAVES LIVES

"During the last two or three years this company has made it compulsory for all of its underground employes to wear an approved type of safety hat when on shift. While not new, this safety idea has been receiving increased attention by many mining companies in recent years, and the experience of this company has conclusively proven that the idea has much merit.

"Toward the latter part of 1935 and on the same day but at different mines, two miners caught under falling ground, were saved from death due to the protection given by their safety hats. One of these men was able to return to work in about 20 weeks with no permanent defect except a stiff neck: the other, though having a fractured pelvis and a fractured ankle from the force of the falling ground, was released from the hospital after two months, and after one year resumed his regular work and now says he is 'as good as ever.'

"With two lives saved in one day and with many serious head injuries from falling objects prevented, we feel that we cannot too strongly urge the compulsory use of approved safety hats by all those employing men for underground work."

H. G. Washburn

General Manager,
Federal Mining & Smelting Co.

### SAFETY-A MANAGEMENT PROBLEM

Accident-prevention methods have become more or less standardized, but management consciousness of safety is the factor that cannot bear too constant repetition. Until the supervisory forces make safety the primary operating consideration, we cannot hope to obtain a successful safety record.

With this thought in mind, the Bureau of Mines is conducting classes in accident prevention. These classes are held separately and distinctly from the customary management safety meetings. In our particular case, classes meet weekly, conducted by a representative of the Bureau of Mines. Attendance includes safety engineers; general superintendent; superintendents; mine managers and assistants; all foremen, both outside and underground; compensation clerks; and office personnel concerned. Questions pertaining to safety and safe methods for working various phases of mine operation, selected by the Bureau of Mines' representative, are given to certain members of the class at each meeting, written answers to be presented to the class on the following week. A general discussion follows the reading of the answers. There is a marked freedom of discussion in these classes, and although the meetings have been held only since early in November of last year, we are confident that they will be extremely beneficial in keeping the management of our mines safety-conscious.

Geo. F. Campbell,
Vice President,
Old Ben Coal Corp.

vations essential to making the proposed safety program effective, it can point with pride to the time, money, and effort already expended to do its part toward consummation of the new program. As a minimum, haulage roads should be cleared of debris of all kinds, including piles of ties, props, rails, or other material; a reasonable clearance should be

established between motive equipment and projections on haulage roads or at any rate on main haulage-ways; haulage roads should be thoroughly protected by timbering; mine cars, mining machines, and all other underground machinery and equipment should be kept in good repair and thoroughly guarded and kept that way; coal mines should be thor-



Prepared to Work Safely

oughly rock-dusted; water should be supplied the workers to be used on mining and drilling machines and on loading machines and on the face region to reduce dust in coal or metal mines; up-todate electric cap lamps should be supplied all workers to give them the best and safest available lighting system to enable them to work with maximum safety and efficiency; all mines should be well ventilated, especially in the face region; a suitable timbering system should be installed and ample timber and timbering supplied; adequate experienced, competent supervisory forces should be provided; these and numerous other phases of good housekeeping and good management should be in thorough effect before the mine operating organization makes any determined effort to "put over" its safety campaign in connection with the workers. Far too frequently the management inaugurates a more or less revolutionary safety campaign by throwing essentially the entire change in procedure on the workers, with very little if any expenditure of effort, time, or money by the company; the workers quickly sense the significance of such a situation and question the sincerity of the employer, with the result that the proposed program is doomed to failure. The mining employer must do his part to a far greater extent in the future than in the past if the stigma of having the worst accident record of the major industries is to be removed from mining; and even if one disregards the humanitarian features altogether, surely no efficient mining executive can fail to be actively interested in trying to make material reductions in an important item of cost, particularly if it can be shown that exercise of a reasonable amount of earnest effort on his part can reduce this cost 75 or more percent.

Once the operating company has tried to put its house in order by making mining conditions (methods, equipment, supervision, etc.) such that the worker



Shot firer tamping shot hole with clay.

really has a chance to work safely if he will do his share, the most difficult part of the problem confronts the managerial forces, namely, education of the workers. This is a real job, by far the most difficult and at the same time the most important one, in trying to make the worker "safety conscious" as regards present-day mining conditions and practices. Protests by management that this educational work is not a legitimate function of the operation of a mine, and that the worker should at least protect himself, are futile because the unduly high rate of accident occurrence in our mines proves that the average mine worker has no adequate conception of what to do for his own protection, to say nothing of the obligation as to safety he owes to his fellow worker and to the mine as a whole; moreover, as has been indicated, the law, as well as public opinion, holds the operator responsible for accident occurrence in and around mines; therefore, whether or not a mine operator likes it, if he does his job well, he and his operating officials must be educators, at least in so far as safety is concerned. All mine officials should be well-grounded in safety, otherwise the so-called educational work they do may result in decreased rather than increased safety. The first and most important educational job of the company is thus to take measures to inform its own mine officials upon up-to-date mine-safety procedure, and this presupposes the existence of some form of mine-safety organization. The safety organization should be one that is kept actually and actively functioning, preferably with the operating heads of the mine, the division, or the company taking the lead and being present at many if not all meetings, to be held at least once a month. All of the bosses and the workers, preferably through committees, should participate. The safety organization should discuss and determine safety policies, and one very important feature should be the investigation of conditions surrounding all accidents and discussion by the safety organization of proper procedure to eliminate similar accidents in future.

If safety is to be given the attention it deserves, its handling should not be entrusted to every Tom, Dick, and Harry in the organization, because what is everybody's business is usually nobody's business. In other words, some one person should be in charge of safety. This is common practice in the larger mines, but is done in relatively few of the smaller ones. In a relatively large property (say with 100 or more employes) at least one full-time safety man should be employed. If he is even fairly efficient, his cost cannot be cnarged to "dead work," as he can save his salary and attendant expenses several times over. In small properties the "heading-up" of the safety work may well be delegated to the mine foreman if he is of the right type and is not already overloaded with work; or it may be placed in the hands of some wide-

### VENTILATION AS AN IMPORTANT FACTOR

Mines with an adequate fresh air circulation, be this by natural or mechanical means, generally have a lower mine air humidity. This lower humidity, coupled with definite air motion, makes for improved comfort conditions. Men are more active and alert. They are not so accident prone because of what might otherwise be a more or less sluggish body and mind. Walkways in drifts and stopes and ladderways are generally drier, thus reducing the slipping and falling hazard. The life of mine timber is usually considerably longer, and men are, therefore, not as frequently exposed to dangerous repair jobs. Furthermore, there is a definite saving in timber consumption. In well-ventilated mines there is less need for compressed air for ventilation purposes, and, since the cost of compressed air, as compared with fan air, is in a ratio greater than ten to one, there is a material saving in compressor operation.

Some years ago a paper dealt entirely with the subject of roof control by means of ventilation, pointing to another hazard that under certain conditions

may at least in part be reduced.

An adequate air circulation will improve the mine air further by the prompt removal of gases from blasting. In some mines mechanical ventilation is a necessity because of the explosibility of sulphide dust particles. An adequate fresh air supply will tend to reduce mine air temperatures in hot mines and will remove gases from gas feeders where such exist. All of these effects have a definite tendency to reduce accidents in mines.

Last, but not least, a well-controlled ventilation system is the best possible safeguard in case of a mine fire. Men are generally able to reach safety through the fresh air intake, and fire fighting is most effective when a fresh

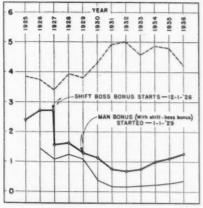
air base can be established in close proximity to the fire.

Any one of the advantages mentioned, and others which have been omitted because allotted space would not permit of further discussion, could be enlarged upon to many times the length of this paper.

Oscar A. Glaeser,

Safety Engineer, U. S. Smelting Refining & Mining Co. awake (preferably technically trained) boss who has had considerable experience in mining, knows safety work at least fairly well, and reads enough current mining literature to keep himself at least fairly well informed, not only upon safety, but on efficiency in mining as well.

It is high time that the safety man be given more adequate recognition as an important cog in mining; for years (even up to the present) he has been looked upon, in certain cases, as a more or less necessary nuisance, and the less ability he has had and the least heard from or of him the better. With the advent of high compensation costs (and unit compensation payments, hence ultimate compensation costs are far more likely to increase than to decrease, therefore prevention of accidents is the employer's main protection against high cost of compensation), the efficient safety man has a place of economic value and service to his employer second to no other unit of the operating organization, though few if any mining organizations recognize this. Today's safety man must be primarily an educator and preferably should be technically trained (though many very efficient safety men are not); he should have had several years of experience in mining and certainly should not be a youngster just out of school; he should be physically capable of making thorough, rigid underground inspections, not some superannuated official for whom the company is under obligation to provide; and, above all, he should know how to get along with men, including the mine bosses as well as the mine workers in general. If he is to be even moderately effective in his work, he should have operating authority, though he should exercise that authority as rarely as possible. If at all feasible, he should be essentially an assistant



CCIDENTS PER 1000 SHIFTS MEN EMPLOYED PER 1000 SHIFTS -

### GRAPH SHOWING TREND OF ACCIDENTS AND POSSIBLE RELATED FACTORS FROM 1925 TO 1936

ABOVE INFORMATION RELATES ONLY TO THE HECLA MINE OF THE
HECLA MINING COMPANY -- WALLACE, IDAHO

### RIGIDLY ENFORCED SAFETY STANDARDS

Although much has been written about safety in all its phases in recent years, the bulk of the good results have come from real desire on the part of an operator to do his part. Safety is pure operating as it should be done. Systematizing the work and standardizing equipment and practices will result

in fewer accidents and consequently lower accident cost.

Let us look at the matter from the angle of operating efficiency together with the decreasing of accidents. When safety standards are used and rigidly enforced along with track and maintenance standards (which also promote safety), a great step has been taken to produce coal at a minimum cost. In fact, the saving in accident cost is a small saving when compared with the saving in operating cost. The safety requirements specify that machinery shall be placed accurately and efficiently, and guarded; wiring must be hung to specifications and guarded; timbering standardized for normal roof conditions; pillar lines kept in alignment; and many other requirements. These tend toward economy and make working conditions safe. Prior to the present trend towards safety and before inspections were given serious consideration, track, wiring, timbering, and machinery installations were considered sufficient, provided coal could be run and the first cost low. Looking back over that period of time, the delays on haulage due to poor track conditions, poor cars, or poorly maintained motors, etc., were inefficient and costly. Poor pillar alignment was the cause of excessive falls and high timbering cost with no chance of timber recovery.

With the present methods of safety organization, the inspectors are constantly bringing to light dangerous and substandard conditions which, when corrected, invariably eliminate a high-cost condition.

It has been conclusively proven that the strict enforcement of safety standards and rules, together with sufficient and intelligent supervision, results in very favorable operating costs.

D. A. Reed,

General Manager of Operations, Consolidation Coal Co.

### THE EMPLOYE BONUS SYSTEM

The Hecla Mining Company has in operation a bonus system, for shiftbosses and underground crews, which is believed to have been the greatest aid in the prevention of accidents.

A shift-boss, working an average crew of 20 men daily, is given a bonus of \$1 daily if his crew has had no lost-time accidents during a calendar month. If his accident rate is equal or less than 1.650 accidents per thousand shifts, he receives a cash bonus of 65 cents per working day.

The employe bonus is given to men working at least 10 days under a shift-boss having no accidents during a calendar month. A drawing is held monthly for those eligible and two \$10 cash prizes are given to each crew.

For two years, before the start of a bonus system, the accident rate averaged 2.676 accidents per thousand shifts worked.

The shift-boss bonus system was used the next two years and the average

rate dropped to 1.617 per thousand shifts. In 1929 the employe bonus was started, the shift-boss bonus being continued. The average since that date has been 1.115 accidents per thousand

The decrease in accidents during the last mentioned period is probably not due entirely to the employe bonus. This period covers the depression

and it appears that the accident rate is dependent to some extent upon the scarcity of work.

> Chas. H. Foreman. Chief Engineer, Hecla Mining Company.

### SHORT CUTS DO NOT GET RESULTS IN SAFETY

It is no small part of our business of mining to see what is being done for safety and then to do what lies clearly at hand. From a look at the record we see mines working for months, and large properties in some instances for years, without a lost-time accident. Excellent safety records are being made with increasing frequency by various mining companies. To many, the idea that it is possible to operate a mine without accidents is new and, consequently, the realization that mines can be operated with few, if any, accidents is not without great importance; for when progress is being made what once was exceptional after awhile becomes the regular order of things.

There is no new short-cut to safe mine operation, or if there is we have not been so fortunate as to make the discovery at our properties. It still requires persistent application of sound safety practices to bring about improvement, but with improvement evidently there is progress. Experience has taught us during the past few years that to avoid eye injuries all employes must wear protective goggles, corrected when needed with prescription lenses. Because satisfactory goggles have become available their use is now standard practice where eye hazards exist. For some years we have considered wearing safety hats and shoes standard practice.

State coal mine safety regulations in Utah provide for the use of permissible explosives only for blasting, shot firing when the shift is out of the mine, use of electric cap lamps, rock dusting, sprinkling, and water on cutting machines.

At our properties 100 percent first aid training is required each year. The safety branch of the United States Bureau of Mines has rendered great service, both by giving this training and persistent educational work.

Premiums are awarded foremen and bosses for meritorious accomplish-

ments in accident prevention.

Safety education and training; safe tools and equipment; sound and progressive methods and practices all are effective and essential to the prevention of accidents. Some applications are new perhaps in one field and old in another, but in all fields in recent years many coal operators by their efforts for safer working conditions are convincing the mine worker that they are interested sincerely in his welfare, thus opening the way to real cooperation and new accomplishments.

Otto Herres,

Vice President and General Manager United States Fuel Co.

### THE WILL TO BE SAFE

There is not much that is not now known regarding the work of greater safety in coal mines. What we lack, both employers, operating staff, and employes, is the will to put into effect what we know should be done.

We need a tightening up of our state mining laws, many of which are laxly expressed and even more laxly enforced. We particularly need a knowledge of the best method to reach the men who furnish the flesh and blood that enters into our coal mine accidents. This matter is one that should be taken hold of by the Union's executive officers. They write and preach about everything but safety—in too many instances there is a veiled opposition among

leaders to safety methods.

The employer, assuming that he has done his part, must learn how best to reach into the souls of his employes, and strange as it may seem, we have made a great success through the medium of cash awards paid to the men in the mines which have passed through the month without a lost-time accident. It may seem strange that a man will respond to what might be construed as a "bribe" in order to save his own life and limb, but human nature has not changed much during the centuries, and inasmuch as actual money can be saved by the reward method, why should the operator hesitate to make use of same?

Eugene McAuliffe.

President. Union Pacific Coal Co. superintendent, or possibly assistant to the superintendent or the general manager; at any rate he should have direct contact with the high officials. His usefulness is likely to be lessened materially if he is forced to be under the control and direction of local mine officials, though he will be almost useless unless he has the ability to work with them. Before the mine-accident rate can be forced down, there will have to be more and better safety engineers, and their work will have to be given much more consideration than has been the case up to and including the present time.

The hard-boiled oldtimer steeped in the traditions of the past who has always believed that, so long as mines are worked, accidents are certain to occur, is difficult to convince that individual coal and roncoal mines, both surface and underground, can be worked a year or more without a lost-time accident, yet this has been done in scores of instances; to try to convince this type of man that mine accident reduction of 50 or more percent on a nation-wide basis is possible, is a large order. Yet this degree of accident reduction has already actually been accomplished on a nation-wide basis in connection with what was considered the least feasible of mine accidents to control or conquer, namely, fire and explosion disasters in coal mining. For the past four years, the coal mines of the United States have had 12 major fire and explosion disasters (a major disaster being one with five or more deaths), and in these 12 major disasters there were 101 fatalities. In the four-year period, 1911-14, inclusive (or the four years immediately after the United States Bureau of Mines was established by Congress, largely with a mandate to try to aid in eliminating or at least reducing mine disasters), there were 47 major coal-mine disasters, total fatalities from them being 1,447. From this it will be seen that in reducing major disasters from 47 in the four years, 1911-14, inclusive, to 12 in the past four years (1933-36, inclusive), the number of major disasters was reduced about 75 percent and the number of fatalities was reduced from 1,447 to 101, or practically 93 per-True, the elapsed period during which this vast improvement was made was more than 20 years; it is also true that at one time the defeatist saying, "It can't be done," was peculiarly applicable to any attempt to eliminate mine disasters, yet today we have good reason to think that it can and will be done. In any event, a long step has been taken toward consummation of the desired result, if the record of the past four years can be accepted as any criterion by which to judge.

By no means as much progress has been made in reducing other types of mine accidents as in connection with disasters (and here it may be well to state that metal mining as well as coal mining has done a good "job" in the reduction of disasters in the past several years, though there were two in 1936, with a



### COMPETITION AND A SAFETY TROPHY

There is no single plan for the promotion of safety which may be applied to all operations, or to the same operation all of the time. Human nature itself is a variable. Not all men are alike, nor is the single man the same all the time. For that reason, constant variety must be introduced into safety programs, and the resourceful executive is always seeking new ways of presenting old ideas.

The commonest device is an appeal to the competitive spirit, and this is best done when it is combined with a dramatic portrayal of the facts.

I have recently placed in effect in the raw materials department of Inland Steel Company an idea which is new with us. It is the presentation of a safety trophy. That, of course, is not of itself new, but the novel idea lies in awarding the trophy on competition among dissimilar operations. Our iron mines, our stone quarry, and our coal mines all compete for it, and to achieve equality we had to appraise the relative safety hazards that were inherent in each type of operation and handicap the contestants accordingly.

After trial and error, we arrived at a basis which is intended to give each contestant an equal chance.

To make the trophy distinctive, we had actual photographs of typical scenes taken for each class of operation, and then had them sculptured in bronze. The result was very striking, and the competition aroused wide interest among all the different groups of operations, even though they were separated by thousands of miles geographically, and this in itself tended to stimulate a feeling of company solidarity.

Clarence B. Randall,

Vice President, Inland Steel Company.

total of 16 killed). Accidents due to falls of men and material, to haulage, to explosives, to electricity, and to miscellaneous causes have not been reduced nearly in proportion to the reduction accomplished in connection with disasters; here is a man-sized job for our mining people to undertake and to do as well with it as they have done with disasters; and, as with disasters, it can be done!

Falls of men and material continue to take about 50 percent of the lives annually lost in our mines (coal or metal), and this kind of accident is now, and has been, one of the most difficult to prevent. However, it is significant that in mines with the poorest or worst overhead or roof conditions (coal and noncoal as well), accidents from roof falls are almost nonexistent, because under such circumstances the hazard is usually recognized and ample provision taken through changes in the mining system, more intensive supervision, or possibly increased attention to timbering and other roof-supporting practices, or perhaps all of these influences as well as others accomplished the result. This fact that often mines with very bad roof



### COORDINATED EFFORT AN ANSWER TO SAFETY PROBLEM

The intensive safety work conducted in the mines of the United States Steel Corporation for the past 31 years has embraced a broad field of activity. From the beginning it was realized that if real results were to be achieved in the prevention of accidents, not only must the work be carefully organized, but there must be harmony and unity of effort. During the intervening years the work has been carried forward in all of its many ramifications, and every endeavor has been made to leave no stone unturned which would protect the life and health of the workmen. General and workmen's safety committees have been established at each mine, which function regularly in all matters pertaining to accident prevention; several million dollars have been expended for the guarding of machinery and for engineering revision of equipment design; daily and periodic inspections are made of all underground and surface operations for the purpose of detecting and correcting unsafe conditions and practices; crews have been organized and trained in mine rescue and first aid; safety rules have been promulgated, and every means has been instituted to educate the workmen in the safe performance of their duties. All accidents are carefully investigated, classified and analyzed, with a view to discovering the causes and devising remedial and preventive measures. Among the many safety devices employed in the mining operations which have proved outstanding in the prevention of accidents are goggles, safety shoes, hard hats, safety fuse, cap and powder containers, electric block signal systems, and safety chocks. The good results attending our efforts in the prevention of mine accidents may be attributed to the interest maintained by the employes in all branches of the industry, from the highest officials down through the rank and file of the workmen.

H. H. Schultz,

Assistant to Vice President,
United States Steel Corp.

conditions have good safety records indicates that if all mines, including those with so-called or supposedly good roof, were required to take the precautions which are now in self-defense forced upon the mines that have known poor roof conditions, accidents from falling overhead material as well as probably from other causes would soon approach the disappearing stage, just as have fatalities from disasters.

Numerous instances are at hand indicating that this roof-fall problem is by no means beyond at least limited control, and while most of them are individual mines or mining companies, one very encouraging example is at hand in which mines of an entire state, by prosecuting a determined, persistent campaign against roof-fall accidents, within a very few years reduced these accidents around 50 percent and thereafter held them within the reduced number and rate.

Probably the greatest advance toward solution of this problem of roof-fall accidents would be recognition by mining people that at least 95 times out of 100 there is "no such animal" as good roof, and that to be safe, all underground roof should be amply supported. The mine with the supposedly good roof, which has now an advantage over its neighbor with the poorer roof, would lose that advantage if the above concept were accepted. However, far too often the supposedly good roof drops on workers beneath, frequently with fatal results (and the "good-roof" mine must pay the expenses of the accident). It is therefore possible, even probable, that in the long run, if the fact is recognized, that there is "no such animal" as good roof and steps are taken to support all roof, the net result would be a dollars-andcents saving to the coal industry and material abatement of accidents from roof falls.

While the owner-operator-management responsibility as to the effect of mining methods and equipment in connection with prevention of roof-fall accidents is almost predominant, the less controllable factor of human or personal action or inaction of the individual worker is but little less, one that depends largely on the management. First of all, it should be recognized that irrespective of age, experience, or other attribute, the mine worker is by inheritance and long-established habit a taker of chances, and the management is confronted with the "job" of educating these very understandable habits out of the worker or of surrounding him with sufficient rigid supervision to protect him in spite of himself. Many people believe that this is a "job" which should not devolve upon the management, but unless management shoulders the burden and does so efficiently, it is certain to pay plenty, not only in dollars and cents because of the high-severity type of accidents which usually accompany roof falls, but also in numerous indirect costs, among them loss of or failure to achieve public support.

Haulage accidents in mines, like the

### THE BONUS METHOD

The Virginia Iron, Coal & Coke Company several years back instituted a system of bonus payment to assistant foremen whereby assistant foremen were paid a cash bonus of \$5 for each month during which there were no lost time accidents occurring to men under their supervision. While we feel that this system was quite helpful in the reduction of accidents we decided to extend and modify it as of the first of this year so as to take in all the mine employes as well as the assistant foremen. Under this modified plan there is held a drawing at each mine at the end of each month for three cash prizes, a first prize of \$10, second prize \$7.50, and third prize \$5. A separate drawing is held at the same time at each mine for a cash prize of \$10 for assistant foremen. Only those who had no lost time accident during the month are eligible to participate in the drawings and they must also be present at the drawing. The occasion of the drawing is made a safety meeting at which short discussions are held on various safety subjects and accident prevention under the leadership of our safety inspector in collaboration with the mine superintendent. Judging by the enthusiasm with which this plan has been received by the men we entertain very high hopes for its success.

J. J. Sellers,

Vice President, Virginia Iron, Coal & Coke Company.

### WET DRILLING IN COAL MINES

The use of wet drilling in coal mines is being adopted to reduce the dust

hazard and, also, the upkeep cost of equipment.

Where rock is being drilled by a portable compressor and air drill, a water tank of suitable size is mounted in the mine car that is used to carry the drill and drill steel. The water tank is connected to the compressor, in order that the water can be kept under pressure at all times, thereby forcing the water through the drill when in operation.

The drill is of an ordinary type, with a water tube through the center. A rubber hose is used to connect the water tank to the compressor, also the compressor to the drill. Ordinary hollow steel, with detachable bits, is being used to good advantage.

The results obtained by this method of drilling are very good, the dust being absolutely eliminated and allowing the drillers to work in an atmosphere that is clear and free of dust particles, also making it safer from an accident standpoint; nor is there any dust to deposit in the working parts of the compressor or drill, thereby reducing wear and the cost of upkeep.

The same set-up can be used on a stationary drill as is used on a portable

E. H. Graff,
Safety Director,
The New River Company.

traffic problem on our streets and highways, constitute a decidedly knotty problem and also an important one, inasmuch as about one-fifth of all mine fatalities in some manner or other come from haulage. The haulage problem in mining, however, should be (in fact, it is) much more readily susceptible of solution than the surface traffic problem, inasmuch as the mine management, even in these days, has a much better opportunity than do surface traffic officials to educate workers as to safe haulage practices and to supervise them and their activities and enforce rules and regulations. Moreover, the main element in connec-

tion with the prevention of haulage accidents lies wholly within the province of the mine operator, namely, the installation and maintenance of safe haulage systems, including hoisting engines, ropes, shafts, trackage, cars, locomotives, and methods of maintenance and use, etc.; and especially in providing ample clearance along haulage roads and well-aligned and graded tracks throughout the mine.

As with roof-fall accidents, the personal equation in connection with prevention of haulage accidents gives management a severe problem, which must be shouldered by the supervisory forces

### SAFETY BELTS AT THE MONTREAL MINE

Though not new, the safety belt is one of the most effective means of preventing accidents at Montreal. Our rule requires a safety belt to be worn whenever there is any danger of falling.

After trying various materials, a Vim leather belt 3 in. wide and 1/4 in. thick was found to give the best results. A strong double-tongue metal buckle, two 3/4-in. steel D-rings, and 11/4-in. by 5/32-in. shoulder straps completes the belt. The straps are crossed at the back and made adjustable in front.

To anchor the belt, an extra heavy harness snap is attached to a 3/4-in. hemp rope treated with pine tar preservative. The ropes used in stopes are 50 ft. long, but not more than 10 ft. of free rope is permitted between the belt and the last anchoring place. For shaft work, a short rope is used with a snap on one end and a piece of chain with a hook and ring on the other to make fast to the steel shaft sets.

Each safety belt is removed from the mine at least once a week, when it is cleaned, oiled, and inspected. With this care, a belt will last from eight to ten vears.

> C. A. Biork. Safety Engineer, The Montreal Mining Company.

### "WHAT'S NEW IN SAFETY"

There is practically nothing NEW IN SAFETY. All safety efforts are aimed at the prevention of human suffering, either for the humanitarian reason of reducing the suffering of humanity or from the financial reason of reducing the cost of accidents. I think that most programs are a mixture of both reasons but we measure success by the financial one. Success in any safety program is only to be won by eternal vigilance because safety is to a great extent a state of mind.

We are always on the lookout for new equipment which will add to our safety work and the past year the two most outstanding things were first, the requirement of the use of hard hats by all inside men and second, the use of safety toe shoes. Every man entering a mine must wear a hard hat whether he be miner, official or visitor and the use of safety toe shoes is compulsory whereever foot protection is necessary. We have many records where these two items have prevented serious injury but we do not think that equipment will take the place of education. We try to remove the causes but above all, we continue safety education.

John C. Cosgrove. President, West Virginia Coal & Coke Corporation.

### A SAFE CAGE SIGNAL SYSTEM

The Stewart Sigaphone Junior Signal System developed at the Montreal Mine has for some time been used to signal from cage to engine house with excellent results. It is simple, and yet places the cage under full control of the rider, even when in motion.

On the cage, the current from a dry battery is stepped up by a coil connected with an insulated aerial attached to the outside of the cage. From 2 to 3 in. away from the cage aerial, an insulated wire is placed in the shaft and run over to the engine house, where it is hooked to a special radio amplifier. When the cage rider closes the switch on the cage, the weak electrical current induced in the long wire in the shaft is amplified to provide an audible signal for the hoist operator.

For shaft inspections and repair work, an extension cord is attached to the switch on the cage, permitting direct signalling from the top of the cage wherever it may be located. It is felt that this safety feature alone is well worth the moderate cost of Stewart Sigaphone Signal System.

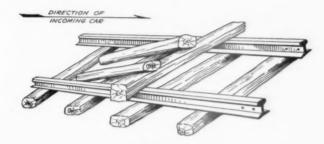
A two-way talking circuit between the cage and engine house may be added to the layout described above.

> L. D. Stewart, The Montreal Mining Company.



### **ADVERTISING SAFETY**

The BULLETIN BOARD has been in use for many years, chiefly as a communication medium. The old style board was crudely built and attracted very little attention, although some good safety posters were displayed occasionally. The old slogan, "It Pays to Advertise" is one we must admit, brings results. Unlike products advertised for sale, safety is free, yet it is just as imperative to advertise safety. Attractive bulletin boards, built along architectural lines, well lighted, displaying unique posters and changed daily attracts attention of workers and we believe accomplishes the desired results, that of making workers ACCIDENT CONSCIOUS.



### **EFFECTIVE SAFETY BLOCKS**

Unless safety rules in regard to chocking are in effect, and enforced, chocks of all descriptions are used by workers to prevent cars from coming into working places, especially where the dip is toward the face. Many fatal accidents have occurred when men were caught by cars, either being dropped into rooms or running over poor blocking. We have found the most effective block consists of one tie and one or two short props. The tie is first placed across the rails and the props are laid parallel with and between the rails, one end resting on the tie.

H. G. Westerland,

Compensation Director,
Chicago, Wilmington & Franklin Coal Company.

### ACCIDENT STATISTICS AS AN ACCIDENT PREVENTION

Accident statistics, carefully compiled, presented in an understandable manner to those in supervisory positions, are an effective aid in preventing accidents. If fore-men are made to realize the tremendous cost of accidents and that it is a cost definitely within their control, the cause of accident prevention will be greatly furthered. Accident statistics should be compiled monthly with a comparison with the previous month and corresponding month of last year, and should be clearly presented to show (1) the number of accidents, fatal, serious, and minor; (2) the cost of each accident; (3) the cause of every accident. It is important that the total number of accidents be shown, for even a minor accident may be the result of a condition that might have caused a fatal accident, or even a catastrophe, had it not been for some fortuitous circumstance. Except in rare instances, every accident is the result of failure to follow the mining law or complying with safety regulations. Few foremen are familiar with the compensation, medical, and hospitalization cost of accidents, and these should be clearly set forth. The listing of the causes of all accidents will help the foreman give attention to that particular part of his mine where accidents frequently occur. No mine management can carry on intelligent accident-prevention work unless fortified by intelligent accident statistical information.

P. C. Thomas,
Vice President,
Koppers Coal Co.

and solved through a combination of education and supervision, by no means an easy task, as the type of person necessary to do a good job in mine-haulage work is likely to be more inherently a "chance taker" than is any other type of worker in mines unless possibly the shot firer in coal mining.

Normally, accidents from explosives (blasting), from electricity, from machinery, and from other miscellaneous causes aggregate but about 15 percent

of the total accidents in our mines, but relaxations or neglect in connection with explosives practice as well as with electricity in mines are very easily capable of causing disasters, such as fires or explosions in both coal and noncoal mines, even one of which might very readily cause fatalities to mount so high as entirely to disrupt the good records of mine-accident occurrence established in late years. A volume could readily be written on the influences of various

kinds exerted by explosives, electricity, or machinery on mine-accident occurrence. All of the conditions in connection with the use of electricity, explosives, machinery, etc., in our mines are under the control of the operating company, and the handling of the personal equation is here again the problem of management, with education and supervision the main essentials.

### KEY MEN IMPORTANT SAFETY FACTORS

The phase of our safety work that to us seems the most important, although not new, is centered around the foreman, the key man, who comes in direct contact with conditions from which accidents originate.

In assuming the responsibility for accident prevention, the foreman is given a set of rules covering the well-recognized hazards, and has the support of the management in their enforcement. He is cautioned that in passing on violations, judgment should not be hasty—that many things are to be taken into

consideration, such as the nature of the infraction and the circumstances leading up to it; that he is to be impartial in dealing with offenders.

In order that the foreman may be always familiar with the progress of the work, he is furnished with statistics showing the days lost on account of injuries, man hours worked, and the frequency and severity rates. He is also advised of the accident cost per ton of coal produced. Once each month, or oftener if deemed advisable, get-together meetings of officials are held, at which time there is a general discussion of matters relating to men and methods.

This is an old safety procedure, and, if followed closely, should produce

results.

F.S. Lenhart,

Charge of Safety and Accident Prevention Work, W. J. Rainey, Inc.

### EDUCATION OF FOREMAN AND EMPLOYE

In reviewing 21 years' experience as self-insurer in lead and zinc mining,

three things stand out in our efforts to prevent accidents:

1. "Shot tubes," a locally developed device similar to a mailing tube closed at one end, of such size as to fit snugly over the stick of powder containing the cap and fuse, and intended to prevent the collapse of this primer while loading. Since its inauguration about 10 years ago careful investigation fails to disclose a single "premature explosion while loading hole" where this protector was being used. One hundred percent results.

2. Hard hats. The first ones in this district were "tin hats" brought back

by men returning from the war, and employed as tub hookers in the shafts. From this start, the adoption has spread to where the larger companies now

have all underground employes equipped.

3. Bonuses. To each foreman whose crew goes free of lost-time accidents throughout a calendar month we give a bonus based on the man-shifts worked by his crew for the month; and a pair of cotton gloves to each work-man in such department or mine. We believe the cost in this manner of foreman and employe education in safety has been probably less than any

John Campbell,

Manager, Insurance Department, Eagle-Picher Mining & Smelting Co.

### COMPRESSED AIR AND TRACK MOUNTED CUTTING MACHINES

In 1926 the Jamison Coal & Coke Company, moved by the desire to obtain maximum safety in face operations, visioned the application of compressed air to track mounted cutting machines.

Its mechanical department, in collaboration with the Jeffrey Manufacturing Company, designed and built a number of such machines, whose successful operation, as described in Bureau of Mines Bulletin No. RI-3196 in 1932, yet continues.

We have recently felt that the advent of the loading machine, for which it has not yet been possible to devise a similar air drive, has, because of dust, lowered the standard of face security so long maintained.

Therefore all machine loading places have been piped for water, enough of which is used to control the dust hazard. In addition, production headings and room entrances are rock dusted weekly.

W. C. Dobbie,

General Superintendent, Fairmont Division Jamison Coal & Coke Co.

"What's Wrong with Mine Safety Programs" can be very easily answered, though application of the remedy is by no means so apparent. If all of the mines of the United States were as earnest and efficient in the prevention of accidents as a few (possibly 10 percent of them) are, accidents in the mines of the United States could readily be reduced 90 percent. There isn't a single main cause of mine accidents (falls of roof or of men, haulage, explosions and fires, electricity, explosives, machinery) that hasn't been met squarely and essentially solved by several mines or mining companies in the United States; but unfortunately many mines effectively handle the problem of accident prevention in one or possibly a few of the main causes of accident occurrence and fail to extend the efforts far enough to cover the others. When every mine management becomes fully aware of the fundamental importance of accident prevention, not only from the humanitarian, but also from the more practical dollarsand-cents point of view, and divests itself of the fatalistic idea that accidents are going to happen anyway, and becomes willing to give to safety the same personal attention now paid to taxes, wage rates, selling prices, etc., then (and probably not until then) will mine-accident programs function effectively and to the ultimate benefit of the worker, the owner or operator, and the general public. Until such time as management can be induced to give its whole-hearted backing to prevent accidents, the present program will probably "carry on" with its slow but fairly steady progress, in which a relatively small proportion of mine manage-

### METHOD OF HANDLING GOGGLES

Having a serious need for all employes to wear eye protection, we tried out several makes and types of goggles. After studying the various types of goggles, we adopted the American Optical Company's No. F-3100 and F-3144 Super Armorplate spectacle type goggles for all employes, except men on dust and grind jobs; for these jobs we are using the F-3105 closed side spectacle goggle.

On starting our goggle program we fitted all men who were wearing glasses with corrected goggles at the same cost as the men who required the plain ones, and all men buying plain goggles and wearing them all the time while at work for 90 days, would be fitted with corrected goggles if needed. This plan has worked out very satisfactorily, for a man who will wear plain goggles for 90 days offers sufficient evidence that fitting him with corrected goggles will not be a waste of money. We were later confronted with the problem of men who purchased goggles not wearing them, and when asked why, they would inform the foreman and safety engineer that they had forgotten them and left them at home or in the wash house, after all of the 350 men at this mine had purchased goggles.

It was decided that in order for men to wear goggles they must have them with them at all time and the following plan was put into effect:

The life check boards were replaced with a goggle rack, which is a rack with slots 3x2x5 in. and 20 slots in a row, and 25 rows or 500 slots. Each man's life check was fastened to his goggle case with copper rivets. Each employe calls for his life check in the morning and receives his goggles and case before entering the mine, and leaves same at check room on leaving the mine at quitting time.

This plan has the following advantages:

- First thought every morning turned to goggles and safety.
   All men entering the mine have goggles with them every day.
- 3. Eliminates possible chance of goggles being lost or left at home.
- 4. Simplifies the checking of men who are wearing goggles.
- 5. All goggles are available for cleaning and repairing on idle days.

N. C. Prudent. General Superintendent, Crescent Mining Co.



. Through the adoption of safety hats and shoes at the properties of the National Fuel Company, one life has been saved and foot injuries practically eliminated....

> T. E. Jenkins. President, National Fuel Co.

ment really does its share and the safety men employed by mining and other organizations, the relatively few state and Federal employes engaged in mine-safety work, and the workers themselves carry the burden and do at least a fair job; but essentially nothing is accomplished in accident prevention in mining compared to what could be done if management would put its shoulder to the wheel in a really effective manner in trying to reduce accidents in the mining and allied industries of the United States.

### STATISTICS AS ACCIDENT **PREVENTORS**

Accident statistics as a means of creating interest among the workmen, foremen and department heads are invaluable, if carefully prepared and properly presented.

These figures can cover such subjects as frequency, severity, tons of coal mined per accident, accident and compensation costs, tons mined per fatality, tons mined per fall of roof, coal and slate, severity for each group of employes, such as transportation men, inside daymen, outside daymen, machine crews, miners and all employes.

The statistics must be presented in a form easily understood and usually are most effective when shown on graphs or charts and properly explained.

One method of getting this information to the workmen is by a series of well organized and planned group safety meetings at which time workmen from the different occupations can be grouped together and the statistics presented in a manner all will understand. If several mines are being operated, charts and statistics can be prepared for each mine and a competitive spirit aroused.

Monthly or semi-monthly meetings should be arranged for all foremen, including the foremen working on the night shifts, and the statistics previously mentioned explained.

However, we cannot depend on statistics alone to prevent accidents in coal mines. We must train and educate the workers and supervisory forces regarding state mining laws, company safety rules and safe methods of mining. We must furnish machinery and equipment fully guarded and protected.

We must keep our mines in a safe and healthy condition and employ a sufficient number of safety minded foremen who are conscientious about their work, and will enforce all rules pertaining to safety.

### J. L. Hamilton.

Safety Engineer, Pennsylvania Coal Mines, Republic Steel Corporation.

### CASH PRIZES FOR GOOD ACCIDENT RECORDS

That "eternal vigilance is the price of safety" should not be accepted merely as a trite remark. Preventable accidents cannot be eliminated from the scene of a mine where there is failure to recognize and assume individual

responsibility to guard against danger.

To bring the fullest measure of safety possible into our mining situation, we are applying the stimulus that is found in awarding cash prizes for good accident records. A raffle for money has an attractive lure that appeals to the interest of most humans. This was one of the features of our safety campaign last year, and there was a drop of 27 percent in the frequency rate and 31 percent in the severity rate. But we are not unmindful that a year's experience in a particular line of human endeavor may not be a reliable criterion for guaging the uncertainty that lies ahead of us as we deal with the many complexities involved in the work of preventing accidents.

Cash prizes are offered to our workers again this year. The regulations that control the distribution of the prizes are summarized in posters, which

read, in part, as follows:

### PRIZES WILL BE AWARDED MONTHLY AS FOLLOWS

|      |             |      |     |   |   |   |   |  |   |    |   |   |   |   |   | Number of Pri | zes-    |        |        |               |
|------|-------------|------|-----|---|---|---|---|--|---|----|---|---|---|---|---|---------------|---------|--------|--------|---------------|
| Numb | Number of M |      | n   | ı |   |   |   |  |   |    |   |   |   |   |   |               | \$10.00 | \$5.00 | \$2.00 | Total Monthly |
| 400  | or          | over |     |   |   |   |   |  |   |    |   |   |   |   |   |               | <br>5   | 6      | 10     | \$100.00      |
| 350  | to          | 399. |     |   |   | , |   |  |   |    |   |   |   | ٠ |   |               | 4       | 6      | 10     | 90.00         |
| 300  | to          | 349. |     |   |   |   | , |  |   | ٠  |   |   | ۰ |   | ٠ |               | <br>. 4 | 5      | 5      | 75.00         |
| 250  | to          | 299. |     |   |   |   |   |  |   | 81 |   |   |   |   |   |               | . 3     | 5      | 5      | 65.00         |
|      |             | 249. |     |   |   |   |   |  |   |    |   |   |   |   |   |               |         | 3      | 5      | 55.00         |
| 150  | to          | 199. | 0 0 |   |   |   |   |  | 0 | 0  | 0 | q |   |   |   |               | . 2     | 2      | 5      | 40.00         |
| 100  | to          | 149. | . , |   | , |   |   |  |   |    |   |   |   | , | 2 | *             | . 1     | 2      | 5      | 30.00         |
| 50   | to          | 99.  |     |   |   |   |   |  |   |    |   |   |   |   |   |               | . 1     |        | 3      | 16.00         |

### REGULATIONS

1. Cash prizes will be awarded monthly at each mine or plant where no compensable accident has occurred.

2. A man must work one-half of his allowable time in a month to receive a chance in that month.

3. Men on salary will not be eligible.
4. Drawings for the prizes will be conducted by workers on the pay day which follows the first of each month

A "compensable" accident refers to an accident which entails a loss of more than six days, and it is used as the basis for the drawing of awards in order to avoid disputes that may arise in accepting lost-time accidents, and also to avoid the forfeit of awards because of minor accidents.

At the close of 1936, each wage earner was given an award, other than cash, in recognition of his individual effort toward safety. The mines and plants which operated the entire year without sustaining a compensable accident were given a "Banner Safety Flag." Possession of these flags is for one

William Conibear,

Assistant Superintendent, The Cleveland-Cliffs Iron Co.

### The Joseph A. Holmes Safety Association Makes Awards

Outstanding acts of heroism on the part of 15 employes of the mineral and allied industries in the rescue or attempted rescue of fellow workers in times of stress and peril were recognized by the bestowal of medals by the Joseph A. Holmes Safety Association at its annual meeting held in Washington, D. C. Notable records made by 69 mining companies or other organizations in extraordinary safety achievement were recognized by the award of certificates of honor. Ten certificates of honor were given to individuals for noteworthy safety records. The Joseph A. Holmes Safety Association, named in honor of the first director of the United States Bureau of Mines, Department of the Interior, is closely affiliated with that bureau.

A gold medal was awarded to Steve Romito, of Cooley, Minn., who lost his life on August 9, 1935, while saving the life of a co-worker, overcome by gases in a shallow shaft.

Ray Eames, a miner in the famous Homestake mine, Lead, S. Dak., was

### IMPROVED AIR CONDITIONS UNDERGROUND

The mines operated by the Vinegar Hill Zinc Company vary in depth from 100 to 350 ft.

The method of mining is by the room-and-pillar system. In some of the mines jack-hammer drills are used and in others the heavier mounted machines, both types being wet machines. Some of the mines are wet while others are dry.

All employes are required to wear hard-shell hats or caps, hardtoe boots or shoes, and wire cloth goggles whenever their work requires the use of goggles.

In the dry mines several men are employed to wet down the roof, walls, pillars, runways, and muck piles. Men engaged in this work are furnished with respirators.

Great attention is paid to ventilation. In a good many cases there are two or more shafts on a property. One shaft is used as the upcast and the other as the downcast. If these shafts do not furnish enough fresh air without fans, fans are used to force fresh air into the mine through the down-cast shaft. Often another fan is used at the bottom of the up-cast shaft to force air out of the up-cast shaft.

On most properties a number of drill holes are put down during the prospecting stage. Later, as the mine is developed, these holes are cut underground. Generally these holes, about 61/4 in. in diameter, are cased to rock. A high-speed, high-pressure blower is installed on the surface, and fresh air is forced into the mine.

Isolated rooms are often ventilated by installing blowers in the fresh air currents underground and forcing fresh air into these isolated rooms by means of flexible tubing. Generally, 12-in. tubing is large enough.

Experience and general observation show rapid changes of air in the mines promotes efficiency and good health.

### J. G. Trewartha,

General Mine Superintendent, Oklahoma-Kansas District, Vinegar Hill Zinc Co.

### NEW AND SUCCESSFUL SAFETY MEASURES

It is not always a matter of what is new in the way of expedients for promoting safety in coal mines, as it is the successful carrying out of those measures which have long been in use. Education plays a large part in fostering safe practices, but education frequently needs the supplementary discipline to make men realize that there is a certain earnestness back of the intent to reduce accidents.

Safety appliances and practices in use at the Nemacolin Mine of The Buckeye Coal Company, subsidiary of The Youngstown Sheet & Tube Company, are quite numerous, but every effort possible is made along the two courses mentioned above to put the safety program across.

Underground, each main intersection is protected by a Nachod signal system, and at each of these points a telephone is located whereby the dispatcher of the transportation system may be contacted. Certain instructions with respect to the passing of signal lights as well as receiving orders from the dispatcher are strictly carried out. Under no circumstances can a locomotive be run past a red light unless the signal system is inoperative, and the motorman does so under instructions from the dispatcher.

Experiments have been made with various sizes, colors, and arrangements of reflector buttons for the protection of men working along haulage roads, but discarded because of hazards that may be created through carelessness. Besides, no accident has ever occurred during the life of Nemacolin Mine due to a locomotive running down a workman along the haulage road.

In the use of goggles, the spectacle type is employed, and any particular type of work that might endanger the eyes of the employe, the use of the goggle is compulsory and enforced. Some exceptions have been made where the additional hazard of limited eyesight has overbalanced the eye protection afforded.

To protect the men and mine from the hazards of coal dust, a water system is used throughout the mine and piped to every working place with sprinkling hose attachments for the use of hose on cutting machines and the shotfirer and loader. The water pressures vary from 60 to 110 pounds per square inch. There is no difficulty in getting the employes to make use of this water and the practice is carried out 100 percent. The combination of water used at the working faces where the coal dust is made, with rock dusting to the last open cross-cut, is believed to be a most suitable, efficient and safe means of preventing any propagation of a gas explosion at the face. This combination supplementing adequate ventilation, which means coursing the air right up to the faces, as well as providing an adequate amount, is the best preventive of fires and explosions known.

Statistics are used in the form of comparative safety records between foremen, sections and departments for the purpose of arousing competitive spirit and to promote safety throughout the organization. These records are published and posted monthly. Action photographs, before and after an accident, with appropriate statements are made up for safety posters and used on all the mine sections, department and general bulletin boards. These seem to attract the most comment, equaled only by interdepartment and intersection records of all classes of employes. These pictures and posters are made by the engineering department at the mine, under the direction of the safety inspector. Inspection reports in detail are furnished each foreman pertaining to his own section and any derelictions pointed out are held against the foreman until the superintendent is notified within an allotted time that the correction has been made.

Awards have not been overlooked in encouraging the efforts of foremen and these awards are based on the number of man hours covered before a lost time accident occurs.

The safety program at Nemacolin is endorsed by the entire Buckeye Coal Company organization, from the president down, and it is felt that the foremen and workmen, by years of experience, have learned and do believe in the sincerity of the efforts put forth to eliminate accidents and the hazards that create such accidents.

Chas. H. Dodge,
Safety Engineer,
A. W. Hesse,
W. H. Gates,

Superintendent, The Buckeye Coal Company.



Gibbs Oxygen Breathing Mine Rescue Apparatus.

awarded a gold medal for risking death from a dynamite blast in June, 1936, in remaining to aid a fellow worker whose foot was pinned under a rock. Eames had barely extricated the man when the blast went off. While both were injured, they had been able to retreat far enough to escape the main force of the explosion.

Quick thinking and extraordinary courage on the part of Joe Senic, employed by the Jewell Ridge Corporation, Jewell Ridge, Va., in December, 1936, probably saved the lives of several miners. Senic jumped from a moving mine locomotive and threw the switch to ditch a trip of loaded cars which had become uncontrollable. For this act of heroism, performed at the risk of his life, he was awarded a gold medal.

Stanley Jarrett, G. H. Merritt, and H. E. Merritt, employed by the Six Companies of California, San Francisco, were awarded gold medals for aiding in the rescue of a fellow workman pinned under timbers in a cave-in at the Broadway Tunnel, West Portal, on February 22, 1936. For about one and one-half hours these men worked at great risk, because of the probability of further caving of overhead material, and finally extricated the imprisoned man.

A gold medal was awarded to C. B. Clark, of the Christie Coal Company, Esserville, Va., for remaining on a runaway trip of mine cars and warning four underground workers by shouts and signals, so that they were able to retreat to safety before the oncoming cars

### UNAVOIDABLE ACCIDENTS ARE RARE

One fundamental requirement of any successful safety plan is that it be

taken seriously by all concerned.

Absolutely unavoidable accidents are rare and in most instances both the workman and his boss have at least a partial control over the events which make an accident possible. In smaller organizations the employment of a safety engineer creates a division of responsibility. The foreman or shift-boss regards safety as the safety engineer's job and when an accident occurs each blames the other.

Our plan is to first make observance of safety rules and safe practices definitely a part of each man's daily task in so far as these things are under his control. Second, we have no safety engineer but require every man in charge of work to function as the safety engineer for his own job. If he is not competent to do this, he is not considered suitable for a bossing job. He is expected to detect hazards to the same extent that a safety engineer would. He is expected to take corrective and preventative measures without being told and he is expected to require safe practices from his men as a part of their regular work. This puts responsibility for safety squarely on the man in charge of work and there is no way in which he can evade it if a slip up occurs in matters under his control.

Incidentally regarding reflector buttons, I wish nocturnal pedestrians on

our highways would wear them fore and aft.

R. D. Leisk,

General Manager,
Sunshine Mining Co.

### DO NOT SACRIFICE SAFETY TO SPEED

In the operation of any mine, whether coal or metal, the ultimate desired results are to attain the maximum of efficiency with the lowest possible cost of production. At the United Electric Coal Companies' various strip mines, the importance of these two points are recognized, but it is not considered either efficient or economical to employ methods of haphazard speed at the sacrifice of safety to the workmen. It is our firm belief that a system based on sound safety practices will prove the most economical.

We have not adopted any set of safety standards, but are guided by the application of sound common sense to the operation as a whole in our effort to detect possible hazards and avoid exposure of the employe to them.

Generally speaking, miners employed in the mining of coal by strip methods are not exposed to as many dangers as miners in an underground mine, but it must be recognized that in any mining operation, where high explosives are used, and where large mechanical excavators are employed in removing large quantities of rock overburden, that safety methods should receive first consideration. Consequently, all workmen are constantly warned of the possible dangers and, when an accident does occur, whether it results in an injury or whether it does not, the causes are analyzed and steps taken to avoid a recurrence of the same type of accident. In addition to this, every conceivable precaution is taken in all phases of the operation; all dangerous moving parts of machinery are guarded, which definitely removes many hazards. The most modern means of transporting and handling explosives are also employed.

In order to carry any safety campaign to a successful conclusion, it is essential that the entire organization be whole heartedly in support of the movement. In this particular we feel very fortunate in having employes of a very high caliber, who readily realize the importance of safety, and who cooperate to the fullest extent with the management in reducing accidents,

involving the human element to a minimum.

M. M. Moser,

Chief Engineer in Charge of Operations,
United Electric Coal Companies.

### COOPERATION AND CONFIDENCE

In the 200 words allotted me to give something definite that has increased safety in the mines, I shall use the two words which symbolize my subject, "Cooperation and Confidence."

Without these two essentials, we will never have the safety record we desire. It is important that we do have a fine safety record, but, before this can be accomplished, the miner, his adviser, and his union must cooperate to the fullest extent. They must be just as willing to penalize as they are to protect. This cannot be obtained without his or their confidence.

We may educate, agitate, give prizes, and outfit every worker with proper clothing, such as shoes, caps, goggles, and gloves, yet they will not give us

mines without accidents.

These things combined with the miner's confidence in our sincerity will, however, give us the desired results. They can conquer who believe they can, but the miners will not cooperate unless they know we are also honestly

Somone has said, "Confidence always pleases those who receive it." It is a tribute we pay to their merit, a deposit we commit to their trust, a pledge that gives them a claim upon us. This is confidence, and it begets cooperation, and cooperation begets safe mines.

> William Roy, Sr., Safety Director, Hanna Coal Company.

### COOPERATION-A SAFETY KEYNOTE

Safety has been the slogan of the Nevada Mines Division of the Nevada Consolidated Copper Corporation for so many years that it has now become

The plan in the interest of safety is one of cooperation of the entire organization. A special safety department with a director is not maintained, but instead, all officials, department heads, foremen, and all other employes are one big committee working in the interest of the movement. Safety ideas are traded with other companies and national safety organizations. The U.S. Bureau of Mines has conducted classes in first aid at intervals and every employe, with few exceptions, holds a first aid certificate which is given upon completion of the full course of instruction.

One of the most satisfactory improvements, in the interest of safety, is the method now used in shooting blast holes in the open pit mine. It is as safe as the handling and loading of comparatively large charges of explosives

can be made.

Until four years ago about half the explosive used was black powder and this powder is always hazardous, especially in proximity of locomotive operation. Holes were fired with electric detonators and when a missed hole occurred there were caps with the powder in the hole. Electric detonators were replaced with Cordeau-Bickford fuse, which is TNT encased in lead, a powder substituted for black powder which cannot be set on fire by a flame or spark, nor exploded by friction or concussion, nor set off in any manner

except with a high powered detonator.

The method: 10-in. holes are drilled with electric churn drills to a depth of 5 to 7 ft. below grade. The bottoms of the holes are sprung with gelatin using water for tamping. The small springing charges are fired with electric detonators. After the holes are sprung they are loaded with the explosive previously mentioned and in the middle of the charge is placed a detonator made of 10 to 20 sticks of gelatin tied together with, and at the end of, the Cordeau that reaches to the collar of the hole. The Cordeau from each hole is attached to a leader. One 8 X cap on the end of the leader shoots all of the holes at one time. There have been only two misses in shooting 12,000

J. C. Kinnear,

General Manager, Nevada Mines, Nevada Consolidated Copper Corp.

### THINK SAFETY

The trite old saying, "Thinking makes it so," has held an inconspicuous place in our working-day philosophy even before the word psychology was on every tongue. The miner of today has this teaching firmly impressed upon his mind in such form as: "To lessen your chances of being hurt, you must THINK SAFETY."

This far flung program for "safety-mindedness" is directed to every employe and has its ramifications in the smallest details of operating within and without the plant. The boss' attitude is one of eternal vigilance. He can not disregard the inspectors' recommendations—even the smallest haz-ard must be removed—for he knows that in time this weakened link may mean wholesale wreckage of life, property and capital. In years past, operators have learned costly lessons by not heeding the warning of danger ahead, but now they agree to spend generously for the ounce of precaution, finding that it brings dividends to the

To attain safety-consciousness, it is not desirable to depress the minds of workers underground by emphasizing the probability and frightfulness of accidents. Rather, it has been found that men react more favorably to positive suggestions such as these:

- I. A plant must be clean, hygenic and orderly.
- 2. Systematic first aid instruction.
- 3. Contests and prizes for sections having fewest accidents.
- 4. Evening meetings to show pictures or to hear talks on the topics of benefit to miners and their families.

The value of good morale and discipline in a mine is well known to safety directors. Anything one might do to cause a miner to take pride in his work will help make the mines safe. "Thinking makes it so" -so THINK SAFETY!

> W. W. Dartnell, Morgantown, W. Va.

reached them. Three pit ponies were killed by the cars. This happened on December 24, 1936.

On March 27, 1936, W. F. Watson, by quick thinking and the use of almost superhuman strength, saved a fellow workman's life in a mine at Flat Creek, Ala. A runaway locomotive hit one being handled by Watson, forcing Watson's locomotive back at high speed and knocking down a man who had been walking along the track. Watson grabbed the man and held to him while the locomotive went about 50 ft., the man's legs dragging under the locomotive bumper. Watson was awarded a gold medal.

On July 28, 1934, two men were caught under fallen rock in a coal mine at Mc-Comas, W. Va. While rock was still falling, Joe Ellis and Amado Bucchi, at great risk, released both men. Gold medals were awarded to both.

A silver medal was awarded Taylor Maddox, of Lynch, Ky., who pulled a coworker off a high-power wire and revived him through the means of artificial

respiration.

Glenn Morrell, of Mascot, Tenn., was given a silver medal for mental alertness and equally quick action when a trip rider on an incline slope was caught by electric power wires and thrown to the ground after he had signaled the hoistman to pull the trip. The man was caught by the power-signaling wires and the unusual signals caused the hoistman to stop hoisting. Morrell threw a piece of water hose around the man's neck and jerked him loose from the electric wires, saving his life.

Lawrence Shaw (deceased), Farr, Colo., lost his life in a fire in the Cameron mine, Farr, Colo., on May 8, 1935, in helping other men to escape from the poisonous gases. Shaw made a dozen or more trips through dense smoke for a distance of 400 to 500 feet each time, helping others to escape. When all the men were out, he started to walk up the slope and fell dead. A bronze medal was

awarded.

George L. Pope, power-shovel operator for the Shell Oil Company of California, Ventura, Calif., was awarded a bronze medal for remaining at his post of duty and taking precautions to protect lives of other workers at risk of his own life. His power shovel, excavating for a deep drain line, cut into a gas line under 500 lb. pressure per square inch. With gas escaping in large volume under heavy pressure, Pope shut off the power on the shovel to prevent ignition of the gas. His life was endangered by debris thrown by the high-pressure gas and also by the possibility of ignition of the escaping gas.

On November 29, 1936, John Thomas and a companion were caught under a fall of slate in a mine at Allock, Ky.; Thomas had a broken pelvis and his companion a broken back. The mining machine on which they had been working kept running; the electric cable took fire and in turn set the coal slack on fire. Thomas crawled to a point where he disengaged the electric power, then ex-

### ELIMINATING A BAD SAFETY RECORD

There are so many factors in a safety program which have to dovetail together in order for the program to be a success that it is difficult to pick any one thing which has importance above another, yet, occasionally we notice outstanding success from the use of something begotten because of a bad safety record.

Such an idea was originated in the Pond Creek Mine of the Pond Creek

Colliery-Norfolk and Western Railway fuel mines in 1929.

Broken and amputated fingers from coupling had been so common in this mine, where the coal is from 36 in. to 42 in. in thickness that it was decided to put stamped cups near the top of the pins to keep the fingers of the brakemen from getting caught between the pins and bumpers, or ends of the mine cars.

The cups, constructed of thick iron plate, 6 in. wide and about  $1\frac{1}{2}$  in. deep are welded solidly to the  $1\frac{1}{2}$ -in. pins, near the top, where the chains

are connected.

The last injury from coupling in this mine was October 8, 1929, and until February 3, 1937, and continuing, to the present there has not been a single

injury from coupling.

During the period from October 8, 1929 to February 3, 1937, 1,091,540 couplings were made by gathering brakemen. Couplings made by main line men, supply brakemen, headhouse crews, etc., are not included in the above.

C. J. Flippen,
Safety Director,
Pond Creek Colliery.

### GOOD LIGHTING PREVENTS ACCIDENTS

Good lighting prevents accidents. Our coal miners are equipped with type "K" Edison electric cap lamps with the strong BM-25-B bulb, but the question arose as to whether the men had good vision even when furnished with good lighting underground. Early in 1936 this company decided that every employe at its coal mines should be furnished with spectacle type goggles with lenses of shatter-proof glass ground to prescription when necessary. The employes are compelled to wear them, except in air currents where the glasses fog. The general plan is along the lines adopted by the Union Pacific

Coal Company, who pioneered this work in this western district.

Accordingly, a skilled oculist and optometrist was engaged to examine the eyes of all underground and surface employes at the coal mines. There were two objectives: First, to give better vision; and second, to reduce or eliminate eye accidents, which had been greatly reduced during the past few years by requiring workmen to wear wire screen goggles when engaged in certain classes of work. The eyes of some I,600 men were examined, and 29.6 percent of the total had major defects requiring correction and were fitted accordingly, some with bifocal lenses. The remainder were fitted with plain goggles. All lenses are of shatter-proof glass, and all frames are individually fitted for comfort, as there is considerable variation in optical centers of spectacles and in nose height, bridge width, and pupillary distance of individuals. The flat lens was adopted for the plain goggle after a long test, as it was uniformly better treated and had less distortion than any other type. Each plain goggle is tested by polariscope and by the so-called transit test before it is given out.

The company bore all the expense in connection with the eye examinations and furnished all goggles free of charge, whether plain or corrected. New employes, however, will be required to pay for their goggles, which will be sold to them at cost. The over-all cost, including expenses and salary of the

oculist, was \$3.32 per pair of goggles.

Sufficient time has not elapsed since the installation to obtain accurate results on increased efficiency, if any, or increased general safety. There have been no eye accidents.

Geo. H. Rupp,

Manager, Mining Department,
The Colorado Fuel & Iron Corp.

#### STATISTICS AND SAFETY

The principal feature of our safety program extending over the past several years is a competitive one, applying to the entire supervisory force.

Statistics are prepared and distributed monthly among our entire official staff, showing the number of men under the charge of each foreman and assistant, together with the man hours worked, the number of accidents, the frequency and severity rates for the month; also for the year to date.

Prizes are awarded quarterly and annually for the best records during the preceding quarter-year and year. In addition, everyone having a perfect

record is awarded a prize quarterly and annually.

These prizes are awarded at a dinner given by the company, at which addresses are delivered on safety and its progress by speakers other than persons in our own organization. Entertainment, including music and pictures, is provided, also.

These dinners have proved to be very enjoyable, as well as instructive and beneficial, in promoting our safety work and keep a keen spirit of competition alive and create an incentive to each foreman to have his record as near the

top as possible.

Our experience, which has been progressively better, proves the effectiveness of these special safety measures adopted, of which the foregoing is only one phase of our work along these lines.

C. C. McGregor,

Vice President,
Carnegie Coal Corp.

#### IMPROVING EFFICIENCY THROUGH SAFETY

In considering the benefits obtained from a safety program, the reduction of accident frequency is very properly used as a criterion of the efficiency of the program. The saving in employe disability and loss of working time, although the prime objective in safety work, are not the only items to be placed on the credit side of the ledger. The twin by-products, of a well planned safety campaign, are increased working efficiency and improved employe good will; these items despite their importance are often minimized or overlooked. Increased working efficiency follows intelligently planned safety work as a result of three principal influences:

First, the improvement of morale and esprit-de-corps in the working force, which accompanies a personally conducted safety campaign by the bosses and supervisors of an organization. Such a spirit is often built up as will compare favorably with the enthusiasm generated in an athletic team by its

coaches.

Second, the lessening of interruptions and set-backs to the work, that result from injuries to workmen, with the consequent shifting of men from other

jobs to take the place of the injured men.

Third, the discussion of any particular job or operation from the safety standpoint often brings to light opportunities for obtaining greater efficiency. Both safety and efficiency tend to increase when intelligent consideration and analysis are applied to each detail of the work. The hard rock miner expresses it as "using the old bean more and the back less."

While it is difficult to measure these influences in exact dollars and cents terms, their effect is none the less real and substantial and can be noticed in

the cost sheet over a period of time.

In order to accomplish the maximum effects along these lines, the safety idea must be raised close to the exaltation of a religious fervor, which it properly should be with everyone engaged in the mining industry.

E. M. Norris,

Superintendent, Fertilizer Department, Anaconda Copper Mining Co.

#### DEEP MINING AND SAFETY

On account of the depth and rock temperatures in the Magma Mine, it is necessary to circulate an unusually large amount of air for ventilation. At the present time this volume is 230,000 cu. ft. per minute, or about 1,250 cu. ft. per minute per man underground.

The high velocities in shafts and certain airways make it necessary that the following rules be enforced.

Smoking is prohibited in all shafts and on all shaft stations, and in all drifts that are timbered up to shafts.

Smoking is prohibited within 50 ft. of all shaft ore pockets, whether timbered or not.

Smoking is prohibited in raises used as main airways, and in all drifts on worked out levels that are used as return air courses.

Open lights are prohibited on all shaft stations.

All areas where smoking is prohibited are adequately posted with large signs 20 in. by 30 in. in size.

It is thought that better results are obtained by restricting smoking in certain prescribed areas rather than to try to stop smoking entirely. Very excellent cooperation in following the above rules is obtained from the men underground as they realize the obvious necessity of them.

#### C. B. Foraker.

Safety Engineer, Magma Copper Co.

\* \* \* We have always sincerely believed in the safety movement and have endeavored to keep the safety idea impressed on our whole organization from the manager to the last employe hired, with every man on the job trained in first aid and holder of Bureau of Mines certificate.

F. W. Nobs.

General Manager, Empire Star Mines.



Safety Cans.

# VENTILATION AND LIGHTING —ACCIDENT FACTORS

Two elements of safety that should not be overlooked are ventilation and lighting.

Temperature, humidity, and purity of the air are controlled by ventilation. This control is accomplished by the circulation of adequate quantities of fresh air, checked by gas analysis at regular intervals for oxygen content.

Experience has demonstrated that the workman's alertness and activity decrease rapidly with the lowering of the oxygen content of the air he breathes, thus making him more liable to accident.

The provision of good light contributes more to safety than any other single element. Without adequate light, the worker will be unable to avoid danger. There has been a decided increase in light available for the workers, from the flickering candle, the carbide light, to the modern storage battery lamp. These are all successive steps that have decreased accident frequency.

It is the duty of every operator to furnish safe working conditions for all of the men under his care, and to safety the closest attention is being given and capital expenditures are being made to provide it.

M. D. Paine.

Tintic Standard Mining Co.

#### TRAINING AND SELF-PROTECTION

Coal mining is recognized as a hazardous industry, where elements of danger are constantly facing the workmen. Men must be trained to use individual effort in order to protect themselves. We consider that one of the most important problems in safety is to give the men employed training in first aid. The men at all of our mines are 100 percent trained in this work. Also, all of our foremen and superintendents are trained in first aid and rescue work.

We encourage the use of safety shoes, safety hats, and goggles, and also assume part of the cost of these articles. In Illinois we have 5,800 workmen, of which 76 percent use safety shoes; 80 percent working underground use safety hats, and 35 percent of the men use goggles; and we believe that in the course of a short time 100 percent of the men in our Illinois mines will be using the safety shoes and safety hats. We find it a little difficult to induce all the miners to wear the goggles, but during the past year we have made appreciable progress along this line, and we expect to continue our efforts until practically all of the men see the value of this safety measure.

All of our mines, whether they are gaseous or nongaseous, are rock-dusted. We also find it a safety measure to have all of the haulage roads, where the motors operate, well lighted. We also find it economical and safer to use steel for supporting the roof instead of timber along the permanent haulage

We have about 1,850 men working in our eastern mines, in West Virginia and Kentucky, and similar safety measures are adopted in these mines.

M. S. Peltier,
Vice President,
Peabody Coal Company.

#### UNDERGROUND SAFETY MEETINGS

A safety feature which by test has been found to give most satisfactory results at all our collieries may briefly be described as follows:

The superintendent of a certain mine has a meeting place prepared on each section of his mine. The place is well timbered, whitewashed, illuminated, and provided with enough benches so that all men working on the section can be comfortably seated. The seats are placed so that the men can face a well arranged bulletin board. Each section foreman is required to hold a 15-minute safety meeting in the morning of the first work day each week. During the week the foreman will prepare his program and he will have each of his men prepared to say a few words on safety. The man may say nothing more than "I suggest that all miners keep all loose coal and slate pulled down." By a system of rotation each man gives his safety thought at least once a month. An inscription is written on each bulletin board similar to the following: "This section has gone — days since John Doe was injured by a falling piece of slate; he lost — days' time." Safety has become the by-word of the men and in 1933 this colliery had the largest number of man-hours without a lost-time accident reported to the National Safety Competition, but was not eligible for the Sentinels of Safety trophy because of having operated less than the required minimum of 150 days during the year. This method is in general use at our collieries and has given most satisfactory results.

C. A. Sine,
Safety Engineer,
Stonega Coke and Coal Company.

tinguished the burning electric cable and coal dust. The men were rescued about six hours after the fire was extinguished. Thomas saved both lives by his heroic act, and was awarded a bronze medal.

The following persons were awarded

certificates of honor for skill in performing artificial respiration or other first-aid work, with saving of life in each case: Marion Tosi, Bell and Zoller Coal and Mining Company, Centralia, Ill.; George Wall, Bell and Zoller Coal and

#### A NEW EXPLOSIVE WRINKLE

The Northwestern Improvement Company, at Roslyn, Wash., for the past few years has experienced considerable trouble with portions of unexploded permissible explosives remaining in the shot holes after the shot has been fired, which, to say the least, creates a very undesirable and unsafe condition.

A study of the situation led to the thought that the trouble was due to the inability of the detonating wave to travel from one stick to the next. The particular explosive in use is normally furnished in sticks 12 in. in length and weighing approximately one-half pound, with the paper wrapping usually crimped lightly at one end, but with several thicknesses of paper at the other end. The usual charge of explosive used is one pound, and apparently in many cases the two thickly crimped ends were placed in contact, which then, in effect, created an air space through which the detonating wave did not pass, and the inside stick did not explode.

Our superintendent, Mr. Thomas Murphy, conceived the idea of having the explosives made in 11/2-in. by 24-in. sticks, containing one pound of Monobel No. 9, which we use as a normal charge throughout the field. The Dupont Powder Company was persuaded to make up an order using these dimensions, and since putting them into use we have had no trouble whatsoever, and evidently the change to the longer stick is solving the problem of unexploded explosives remaining in the holes, and eliminating one danger, in favor of safety.

D. R. Swem,

Manager of Coal Operations, Northwestern Improvement Co.

#### SAFETY—A PERSONAL MATTER

The latest efforts along safety lines have been the use of glass goggles by all employes during all working shifts. As a result, eye injuries have been reduced to a minimum.

Another safety measure has been to require the use of dust masks by men when using the power rock dusting machine to minimize the danger of contracting silicosis and skin affections.

Safety work face bosses are employed to supervise the loading operations so as to have continuous personal contact with all employes. These bosses are all certificated men—picked for their intelligence and ability.

We are starting a series of meetings with various groups of men. For instances, the fire bosses, face bosses, inside electricians and mechanics, machinemen and drillers, loader men, haulage and trackmen, etc., assemble to discuss safety measures along the lines these groups are most particularly interested in. Thus the hazards of each line of work are taken up directly with the men most competent to discuss them. The accidents, classified according to occupations, are then discussed and ways and means devised to eliminate them.

After full discussion of the details of work and hazards has been had among the various groups, safety rules are revised and adapted to the new conditions brought about by the mechanization of the mines.

We believe that personal attention and admonition are much more effective than written rules, although these should not be neglected.

Moroni Heiner,
President,
Utah Fuel Co.

Mining Company, Centralia, Ill.; Albert Long, Alabama By-Products Corporation, Dixiana, Ala.; Sam Gray, Shell Oil Company of California, Long Beach, Calif.

Certificates of honor were given to the

following individuals for long-time service in promoting health and safety in mining, for long-time employment in mining without an accident to themselves, or for skill in supervising the work of others in mining operations, for

long periods: M. V. Collier, foreman, Stonega Coke Works, Stonega Coke and Coal Company, Stonega, Va.; John Howard, assistant foreman, Stonega Coke Works, Stonega Coke and Coal Company, Stonega, Va.; T. S. Taylor, foreman, Ohio Oil Company, Haynesville, La.; August Knoefel, Terre Haute, Ind.; Thomas Thomas, Buckner, Ill.; John S. Waldrop, Praco No. 10 mine, Praco. Ala.

The Association awarded certificates of honor for extraordinary safety achievement to 33 coal mines or mining companies, to 21 metal or nonmetallic mineral mines or mining companies, to 6 petroleum organizations, to 8 cement organizations, and to 1 miscellaneous or-

ganization, as follows:

Ajax Pipe Line Corporation, Tulsa, Okla.; Alta Coal Company, Inc., Summit mine, Birmingham, Ala.; the American Agricultural Chemical Company, Phosphate Rock Mines Division, Pierce, Fla.; the American Boston Company, Hiawatha No. 2 mine (underground), Iron River, Mich.; American Zinc Company of Tennessee, Mascot No. 2 mine, Mascot, Tenn.

Balkan Mining Company, Danube (open pit) iron mine, Bovey, Minn.; Bennett Mining Company, Bennett (open pit) iron mine, Keewatin, Minn.; Buckeye Coal Company, Nemacolin mine,

Nemacolin, Pa.

Calumet Fuel Company, Somerset mine, Somerset, Colo.; Carnegie Coal Corporation, Pittsburgh, Pa.; Certainteed Products Corporation, Akron gypsum mine, Akron, N. Y.; Colorado Fuel and Iron Corporation, Morley mine, Morley, Colo.; Columbia Quarry Company, Quarry No. 1, Columbia, Ill.; Consolidation Coal Company, Inc., Mine No. 206, Jenkins, Ky.; Consumers Mining



Company, Harmar mine, Harmarville, Pa.; Crete Mining Company, Albany (open pit) iron mine, Hibbing, Minn.; Crucible Fuel Company, Crucible mine, Crucible, Pa.

Diamond Coal Company, Providence,

Elkhorn Piney Coal Mining Company, Coxton mine, Coxton, Ky.; Empire Oil & Refining Company, East Chicago refinery, East Chicago, Ind. Franklin Coal Mining Company, Pow-

hatan mine, Powhatan, Ala.

Hanna Iron Ore Company, Hiawatha No. 1 mine (underground), Iron River, Mich.; Hanna Ore Mining Company, Mesabi Chief (open pit) mine, Keewatin, Minn.; Hanna Ore Mining Company, Mississippi (underground) mine, Keewatin, Minn.; Helvetia Coal Mining Company, Yatesboro No. 5 mine, Nu-Mine, Pa.; Hoyt Mining Company, Scranton (open pit) iron ore mine, Hibbing, Minn.

Industrial Collieries Corporation,

Johnstown Division, Johnstown, Pa.
James Mining Company, James (underground) iron ore mine, Iron River, Mich.

Lehigh Portland Cement Company, Birmingham quarry, Birmingham, Ala.; Lehigh Portland Cement Company, Iola plant, Iola, Kans.; Lehigh Portland Cement Company, machine and blacksmith departments, Union Bridge mill, Union Bridge, Md.

Marquette Cement Manufacturing Company, Cape Girardeau, Mo.; Medusa Portland Cement Company, Toledo plant, Toledo, Ohio; Medusa Portland Cement Company, York (white) plant, York, Pa.; Miami Copper Company, Miami, Ariz.; Montreal Mining Company, Montreal mine, Montreal, Wis.

North American Cement Corporation, New York; North Carolina Exploration Company, Fontana mine, Fontana, N. C.; North-East Coal Company, Thealka, Ky.

Peabody Coal Company, No. 43 mine, Harrisburg, Ill.; Penn Iron Mining Company, East Vulcan (underground) iron ore mine, Vulcan, Mich.; Pickands Mather & Company, operators, Mather Collieries, Mather, Greene County, Pa.; Pittsburgh Coal Company, Montour No. 10 mine, Library, Pa.; Pittsburgh Coal Company, Somers mine, Pricedale, Pa.; Pittsburgh Coal Company, Westland mine, Westland, Pa.; Pittsburgh Coal Company, Arnold mine, Fayette City, Pa.; Pittsburgh Coal Company, Banning No. 2 mine, Whitsett, Pa.; Pocahontas Fuel Company, Inc., Pocahontas, Va.

Republic Steel Corporation, Julia mine (underground), iron ore mine, Virginia, Minn.; Republic Steel Corporation, Martin mine, Northern Coal Mines, Martin, Pa.; Republic Steel Corporation, Northern Coal Mines, Uniontown, Pa.; Republic Steel Corporation, Susquehanna (open pit) iron ore mine, Hibbing, Minn.; Richmond Iron Company, Rich-mond (open pit) mine, Palmer, Mich.; Rochester & Pittsburgh Coal Company, Helvetia mine, Helvetia, Pa.; Rochester & Pittsburgh Coal Company, Kent No. 2 mine, McIntyre, Pa.; Roosevelt Oil Company, Mount Pleasant, Mich.

#### MAKE EACH EMPLOYE SAFETY-CONSCIOUS

We are located in the Tri-State district. This is comprised of a portion of three states: northeast Oklahoma, southeast Kansas, and southwest Missouri. We have the Tri-State Safety Council. This organization meets at Picher, Okla., every two weeks. It is supported by the mining companies and attended by both supervision and mine and mill employes. District safety problems furnish the subjects for discussion. The object is to promote safety-consciousness in the individual. Recent accidents are discussed and methods of prevention suggested.

Our company employes are furnished with a safe practice booklet and requested to read and comply with same. Our accident-prevention equipment consists principally of the following:

All underground employes are required to wear skull guards. They are responsible for the saving of many lives.

Eye protection is furnished. Nonshatter glass goggles for surface work

and screen goggles for mine use.

Guard toe shoes and boots are furnished at cost and, while not compulsory, are worn by a majority of the employes.

Use of shot tubes is compulsory when loading bore holes. We have no record of a fatality or premature explosion where the tubes were being used over a period of several years.

Shooting on shift is prohibited. Recent dust counts show we are well

within the permissible range.

H. W. Giessing,

Safety Engineer, Commerce Mining and Royalty Company.

#### SAFETY-A DUTY AND AN ECONOMY

From a standpoint of economy, accident prevention is good business. From

a humanitarian standpoint, accident prevention is a duty.

In our own accident-prevention program, we properly safeguard machinery, keep the employes' interest at high pitch, impress the employe with the dangers of carelessness, and make the supervision directly responsible for those men working under him.

In an effort to keep the employe interested, posters, bulletins, shift meetings, and participation in safety contests such as those sponsored by the State Safety and Hygiene Department and U. S. Bureau of Mines are some of the

methods used. We have, to a large extent, abolished carelessness by strict discipline against "horseplay," and the use of statistics.

The supervisors, to get the personal feeling, have unit meetings with the men. A unit will consist of either six or ten men as the case might be. These meetings are open to suggestions and their discussion. The supervisor then makes a report as to these meetings, including time, place, and suggestions, which goes to the general mine foreman and then to the safety director. In this way, we impress the employe that he is an important factor in the program and receive some very helpful suggestions from him. The supervisor knows that, since he is responsible for the department, he is also responsible for the safety of that department.

Goggles, safety hats, and safety shoes are 100 percent in our organization,

and have proven very beneficial in the elimination of accidents.

Since the inception of our safety program in 1929 to 1936, inclusive, we have reduced the number of accidents 82.6 percent.

C. J. Young,

Personnel Manager, The Wheeling Township Coal Mining Co.

Sagamore Ore Mining Company, Sagamore (open pit) iron ore mine, Riverton, Shell Petroleum Corporation, Minn .: East Chicago refinery, East Chicago, Shell Petroleum Corporation, Houston, Tex., refinery, Houston, Tex.; Standard Oil Company of Louisiana, Shreveport, La.; Stonega Coke and Coal Company, Arno colliery, Arno, Va.;

Stonega Coke and Coal Company, Stonega colliery, Stonega, Va.

United Electric Coal Companies, Mine No. 11 (open pit), DuQuoin, Ill.; United States Fuel Company, King Mine No. 2, Mohrland, Utah; Universal Atlas Cement Company, Duluth plant, Morgan Park, Duluth, Minn.

#### FIRST AID AND MINE RESCUE EXPERIENCE

At the recent examination held under the direction of the Colorado State Board of Examiners of Coal Mine Officials, one of the questions was, "state what experience you have had in first aid and mine rescue work."

While the candidate for a certificate probably did not fully realize the bearing his answer would have upon his making the passing mark, nevertheless, the lack of this experience placed a condition upon a number of men who would otherwise have obtained mine foreman certificates.

When an accident occurs underground, the most natural thing is to send for the mine foreman or assistant, and if there is no one close at hand who is trained in first aid, to send for the nearest worker who is so trained.

Naturally at all mines of any importance, it is desired to have the greatest possible number of first aid and mine rescue trained men. A great work is being done by the United States Bureau of Mines in first aid and mine rescue instruction. This bureau cannot bear all of the burden unaided however, and must have the support of the mine managements, particularly of those officials who are in closest touch with the men. The Colorado State Board of Examiners has taken the stand therefore, that in order to become a mine foreman, or assistant, the candidate must have taken a course in first aid and mine rescue training and he and the men under him are encouraged to avail themselves of the opportunity of study and training which is provided by the Federal and state governments for both men and women in Colorado.

F. W. Whiteside,

Coal Mine Engineer, Denver, Colo. Valier Coal Company, Mine No. 1, Valier, Ill.

Woodward Iron Company, Dolomite mine, Woodward, Ala.; Woodward Iron Company, Mulga mine, Mulga, Ala.

Youghiogheny and Ohio Coal Company, Charleroi mine, Charleroi, Pa.

In his annual report to the Association, President J. W. Finch, Director of the Bureau of Mines, called attention to the excellent safety record of the mining industry in the past several years, the record for the past four or five years having constituted the best safety performance in the history of mining in the United States. Awards of the Association, he said, continued to exert a helpful influence in the attainment of this safety record. The awards evidenced that mines are becoming safer working places and that those engaged in the mineral industries have displayed the highest attributes of mental alertness and physical courage which are necessary when emergency arises.

Data for the awards were assembled under the direction of D. Harrington, secretary to the Association, who, in his annual report, stated that the mining industry is now pointing towards a definitely decreasing rate of accident occurrence, this being especially true of coal mining.





Instruction As a Means of Preventing Mining Accidents By John L. Boardman

> A Successful Accident Prevention Program By W. H. Comins

Relation Between Safety and Efficiency in Mining By James K. Richardson

Safety Activities of the Alabama By-Products Corp. By O. V. Simpson

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INSTRUCTION As a Means of Preventing Mining Accidents

By John L. Boardman\*

HERE are several peculiarities which distinguish mining from other basic industries. Some of these are the comparative cost of equipment and workmen's compensation; the independence of the miner to supervision; the daily change in the miner's scene of operation, and the wide scope of his activi-ties. The first of these, "comparative costs of compensation," makes the prevention of accidents necessary as an operating problem, while the others are factors of difficulty in accomplishing

accident prevention.

To substantiate our statement regarding the comparatively high cost of compensation with reference to equipment, a mine employing a thousand men might require as much as a half million dollars worth of tools, machinery and supplies, but the workmen's compensation law may set a value of \$10,000 on the life of each man. Thus, to lose all the machinery and equipment in one great accident would involve a loss of its cost, while such a catastrophe involving the employes might cost ten millions in compensation or 20 times as much. To get a true financial picture of the relative importance of protecting life and protecting equipment we must bear in mind that each time a mine employe checks on at the timekeeper's window he is, in effect, handed a \$10,000 purse, any part or all of which might be lost during the shift.

In an industry in which the supervisor is able to stand at some point of vantage from which he may view the

<sup>\*</sup> Chairman, Bureau of Safety, Anaconda Copper Mining Company.

performance of each man as he goes through the day and in which each has a very limited cycle of movements, little or no instruction may be necessary. But in mining, working faces advance, quality and quantity of ores change, ground movements take place, explosives do not act uniformly, timber is variable, ventilation and lighting conditions change, transportation fluctuates, unsuspected seams and slips and harder or softer rock serve to alter and change the miner's plans. These, along with other factors in the miner's work, make it necessary that the miner be a sort of "Jack of All Trades" and spreads his requirements for knowledge and skill over almost the whole field of specialized workmanship.

When we consider these peculiarities of the miner's job in connection with the fact that the supervisor cannot usually visit the miner's comparatively isolated working place more than twice a shift and can spend not more than two minutes with the miner at each visit, we realize that the miner is almost wholly independent of the supervisor 99 percent of the time. It is consequently highly essential that the supervisor improve his time for instruction to the utmost while he is with his men. There was, perhaps. a time when the miner knew and understood his job quite as well as did the boss and no doubt there are vet many such individuals, but a very great many modern miners are far from being the capable and diversified workmen of former years. In addition to this, there have been a great many changes in mining hazards with which even the old timer finds difficulty.

It is quite generally agreed that probably not more than 10 percent of all mine accidents are due to remediable physical defects of tools, materials, methods or conditions, but that the remaining 90 percent are due to incompetence, ignorance of the hazards, awkwardness, lack of foresight, or other delinguencies of the injured. It is only through a program of constant instruction that these deficiencies can be overcome. We do not mean the off-hand instruction which a boss gives in the familiar phrase "Now be careful and don't get hurt." We mean the most minute details which are a necessary part of every order. Every complete order consists of four essential parts: First, what to do; second, how to do it; third, when to do it; and fourth, who in particular is to do it. As an illustration, it is no longer sufficient to tell a miner to reblast a missed hole. He must be told also how to reblast a missed hole. Quite recently we caught two men attempting to relight the old fuse which projected from a missed hole although they did not know whether the fuse was 6 inches or 6 feet long. It is no longer sufficient to tell miners to set a stull under a loose piece of ground. Recently two men were told exactly that. obeyed but did not use a headboard, with disastrous results. Men must not only be told to bar down loose rocks but must be told to clear away underfoot before

barring down and where to stand safely. A great deal more space than is allotted to this article would be required to name all of the items in mining in which very detailed instruction is necessary but these need not be thrown together in one lot. We might say here that supervisors, foremen and shift bosses know from experience and without being told what these things are but then we would be guilty of the very thing we are opposing, that is, making generalities of the things which should be specific. These details of instruction must be handled singly from day to day as they present themselves and when so handled by an intelligent supervisor, will result finally in the development of a spirit of safety in the most indifferent of crews.

# A Successful ACCIDENT PREVENTION Program

By W. H. Comins\*

HE subject of an accident prevention program in a small plant is one of great importance. How to make such a program effective is of greater importance.

It is needless to say that the management is the key to the situation. I have in mind a plant of less than 100 employes, which plant for various reasons had no definite accident prevention campaign until two years ago. The experience of the last 18 months shows that the men are rapidly becoming safety conscious and need only sympathetic and ever watchful leadership.

The program was inaugurated with a clean up campaign, during which, one of the clean up men stepped upon a protruding nail. The insurance company immediately issued instructions relative to the need of removing all nails from scrap and loose boards during construction work. This criticism was well founded but hardly compatible with the then stage or development of the plant's accident prevention program. Today, the protruding nail hazard has been eliminated.

Briefly, the program consists of meetings held once every month, which are attended by all plant employes and upon company time. The meetings do not last over 25 minutes. The plant superintendent comments briefly on safety points of current interest and also on the recommendations of the plant safety committee of three. A guest speaker is next on the program. Jurists, lawyers, doctors, ministers, members of state highway patrol and the state mine inspector have appeared at the safety meetings as guest speakers. The speakers, who naturally refer to safety in their remarks, are allowed to select their own subjects but are diplomatically asked to

be apostles of brevity as well as of safety.

The plant personnel greatly appreciate the several points of view of the speakers and look forward to seeing a new face and hearing the old safety message in a new form.

The above-mentioned safety committee of three is selected by the management for one month. It is their duty to carefully inspect every department of the plant, listen to all safety and good house-keeping recommendations that may be offered to them by the employes and then prepare a written report for the management and for presentation at the next succeeding safety meeting.

National Safety Council Poster Service is used throughout the plant.

The safety program covers safety in the home, on the highway and on the job. The management at all times, stresses the point that the best safety device is a safe workman and impresses upon the men the following definitely constructive formula for avoiding accidents, "clear heads, steady hands, watchful eyes, see that you have them, see that you use them."

Experience to date has proven the above outlined program to have been very successful in reducing plant accidents. The plant housekeeping has been greatly improved. The use of goggles and respirators, when needed, has been wholeheartedly accepted by the employes. The plant employes have advanced so far along the highway of safety that any criticism or suggestion now presented by the insurance department is received in a spirit of cooperation and acted upon in a wholly constructive attitude. Furthermore the plant accident prevention program has advanced a long way toward perfection without the necessity for printed rules and regulations. It is doubtful whether printed rules and regulations will ever be found necessary for the successful accomplishment of the program.

#### Relation Between SAFETY and EFFI-CIENCY in Mining

By James K. Richardson\*

EBSTER has defined EFFI-CIENCY as "the ratio of the energy or work that is got out of a machine to the energy put in." He also defines SAFETY as a "condition or state of being safe; freedom from danger. Hence, quality of making safe or giving confidence, insuring against harm, loss, etc."

To the average individual no apparent relation between these two definitions could possibly exist, however, to the mine operator, whose property has shown profits during the past few years, there is a very definite relationship. Discuss with him the connection between the two,

<sup>&</sup>lt;sup>o</sup> Local Manager, National Lead Company, National Pigments & Chemical Division, Potosi, Mo. Former Chairman, Mining Section, National Safety Council.

<sup>\*</sup> Safety Engineer, Climax Molybdenum Com-

and he will certainly show you that his accident prevention work has kept his property "out of the red." Discuss with another operator who thought accident prevention work an unnecessary expense and who did away with it during the depression, and he will inform you that he now realizes there could have been less red ink on his balance sheet if his safety program had been maintained.

There are two ways of doing work—a right way and a wrong way. We can hardly say that the way that kills or maims men is the right way. If our process tears up men and machines it is surely not efficient. We feel that we are correct when we say that the safe way is the right way! Hence, there are numerous reasons why safety and effi-

ciency go hand in hand.

Unquestionably, low cost production is the true basis of efficiency. However, no property can produce cheaply for long if their low cost is due to a cheapness acquired by employing men that are notoriously poor workers. Although the daily labor cost may be low, the ultimate job cost is high. These poor workers are the men that the efficient organization gets rid of-the "cream of the crop" are hired in their place. When a mine gets a reputation for unsafe working conditions, the best men leave-the poor ones stay-they can't get work in an upand-coming organization. Without the best men, and with only the worst, you can't reasonably expect profits or efficiency. You have heard men say that "such and such" company was a man killer, and that they carried men out every day on stretches. If your company has this reputation LOOK OUTyour best men are going to be absorbed by your rival who has excellent working conditions.

Too much time is lost on each job, each day, due to unsafe conditions. If the workman must spend half his time dodging falling rock, or watching where he puts his feet or hands, production costs are rising. The smart operator of today is standardizing every mine operation. When these standards are not met, the job is rejected. When the

standards are met, the employe does not have to worry about his working place-he knows it is safe-he knows where his ladders for exit are-and he knows that he must keep the same standards as the man before him. His knowledge of his personal wellbeing allows him to devote his full time to his work.

No one can deny that when a job is well done it is more easily maintained. When a job is safe, all components of the job are in first class condition. By keeping things in first class condition, maintenance costs are lowered, and those repair costs are major items when we look over our production cost sheets. How many times have you seen timbermen tearing out old timber, that had it been placed properly at first, would never have had to be torn out? This is an altogether too frequent a happen-stance. Other jobs are similarly handled. Why do a job twice, when once, well done, would suffice.

If we are allowed to continue to assume that the efficiency of an organization is to be based upon these low production costs we can hardly overlook the costs of accidents and the necessary compensation provisions. The provision of workmen's compensation has become truly a burden to the entire mining industry. Each year these costs have steadily mounted until today they are forcing our industry to become safety conscious. This burden could have been lessened if more mine operators had developed safety programs at the time the other industries were adopting the idea. The very fact that in 1935 our industry stood 29th in frequency and 30th in severity in a list of 30 major industries clearly indicates why this cost is rising, and there is nothing to indicate that our standing was any better during 1936. Those mines that have effective accident prevention programs are beginning to carry their own insurance and they are finding that the cost of workmen's compensation is not such a burden when it is unnecessary to carry and pay for providing protection in unsafe mines not belonging to them.

Each time an accident occurs there arise many costs besides medical and compensation. These are called "hidden costs"—they are not easily tabulated, but they are there and they reflect on your cost sheet. Let us take, for example, a haulage accident on the main haulage road—two men are injured; track is torn up; cars and motor are damaged. How much do those persons cost you that try to help the injured? And, those bystanders that stand around

talking about the wreck? What about prevention courses were given by the

production while track is being repaired and wreckage cleared away? accident has a damaging effect upon the morale of the other workers, and surely a high morale is of value! There are many other things there, that can't be put in dollars and cents directly, but indirectly they have reached into the company pocketbook for their share. If the wreck had not occurred the cost would not have been there! You may say that even with an accident prevention program the wreck would have occurred. Maybe so-however, if the program has been backed up by management, through an earnest desire to make it effective, the odds are against the accident! Unfortunately, we can never tell what accidents have been prevented-we can only see that our accident rate has fallen and, logically enough, there have been corresponding drops in our production costs.

The experience of our company, in this matter, is no different from that of hundreds of others who have found out that SAFETY AND EFFICIENCY are most surely "sisters under the skin."

#### SAFETY ACTIVITIES of the Alabama By-Products Corp.

By O. V. Simpson\*

URING the year of 1936 we started an educational campaign to promote safety among our employes. This was done through the medium of training men in first aid, accident-prevention courses, mine rescue, night school. Also, conducted an examination for all supervisors (mine foremen, sectional foremen, and fire bosses). This examination was the same as given applicants for mine foremen, and fire bosses certificates, by the Alabama State Mine Board of Ex-Sixty-three supervisors and prospective supervisors took the accident course, 21 men took mine-rescue training, and 102 men were enrolled in the evening vocational school, where modern and safer methods in mining are taught. The first-aid, mine-rescue, and accident-

> United States Bureau of Mines, and assisted by local instructors.

A central safety committee was organized, which is composed of the general superintendent, chairman, all mine superintendents, and the safety director acting as secretary. This committee meets once each month to discuss accidents - ways and means of preventing them. Also, discuss inspection reports



Properties of the Climax Moylbdenum Co.

\*Safety Director.

made by the safety director and the superintendents' inspection committee. The superintendents' inspection committee is composed of two superintendents and the safety director, who visit one of our mines each month to make a one day's inspection. The inspection is made with the idea in mind to locate and eliminate unsafe conditions and practices. Two meetings of the entire official organization, which included the sectional foremen, were held to discuss the records made at each mine and ways and means of preventing accidents in the future. Two memberships were purchased from the National Safety Council, which provides appropriate safety posters. There were six bulletin boards installed at our mines. All mines were entered in the National Safety Competition Contest. Two banquets were given to two mines for good safety records. We established a system whereby any mine operating two consecutive months without accidents, a banquet is given the foreman. This banquet is attended by all general operating executives of the company.

One of our mines was changed from carbide to Edison battery lights for the miners. Also, the improved Edison lamps were put in at another operation,

in place of the older type lamp. There were 34 new headlamps installed on mine locomotives. There were a total of 16 underground first-aid stations, fully equipped, installed. We sold 611 safety caps (hard) to the employes; made one mine 100 percent equipped with caps; also sold 202 safety or hard-toed shoes.

There were 62 shelter holes provided on locomotive haulages, 51 car derailers to catch runaway trips, and 95 safety car stops were installed on locomotives at certain points within the mines. Also, there were 63 insulated mats installed in decks of locomotives and at stationary electrical switches. was a total of 202 different machines guarded. Approximately 30,000 lin. ft. of trolley wire was shielded and 128,786 lin. ft. of entry rock-dusted. Also, the rock-dusting of long-wall faces was started. There were 14 blasting units provided for shooting long-wall faces. The ventilation of all mines was improved.

During 1937 there will be a continuance of the safety work and program, upon which we have embarked, and, in addition, there will be an extension of our safety work as conditions and necessities warrant.

#### Does SAFETY Pay?

By Geo. Martinson\*

FIFTEEN or 20 years ago a mine executive may perhaps with propriety have asked the question: "Does Safety Pay," but to ask that question now would indicate that the management had not kept informed on one of the very important methods of increasing efficiency and decreasing one of the important items of cost.

Mining companies which have been engaged in active and sustained programs of accident prevention have found that they have been able to keep their compensation costs well below 1 percent of their payroll. There are some companies who have had from one to three successive years in which they have had no accidents whatsoever, and the compensation costs correspondingly low.

Another operator who had experienced a fairly reasonable cost of \$3.75 per \$100 of payroll was able after a few years to work their cost down to \$1.60 per \$100.

These are not unusual or unattainable records and in our opinion, further savings can be made.

The above illustrates that safety does pay in the items that are reflected on the cost sheet. However, in our opinion the figures given represent the minor part of the savings.

No one now doubts that the "hidden costs" of accidents are much greater than the losses paid in compensation.

If well over one-half of the absences from work of injured employes can be eliminated and the other delays incident to a severe injury minimized, it is evident that there will be substantial savings. We call your attention also to the fact that many times, personal injuries are accompanied with damage to mechanical equipment that causes costly operating delays.

Personal injuries are an indication that some one has at some time failed to do the "right thing," and the most successful mining or industrial operation is one where there are the fewest of such failures.

At present industry is facing increased taxes to support various social programs. Why not increase your accident prevention programs and make them so effective that the savings will pay a large part of our contributions to the various social security funds? Labor should be willing to cooperate in such an endeavor, for it is to their interest to eliminate personal injuries and continue on the payroll rather than on compensation.

Great strides have been made where honest, sincere and sustained efforts have been made. Mining can be made a still safer occupation and at the same time more attractive to our young men who will be called upon to assume the responsibility of supplying the future needs of our civilization with the products of our mines.

#### The DOLLARS and CENTS Value of a Safety Program

By Otto Herres\*

T SHOULD no longer be necessary to urge the value of safety to the mining industry. Safety today is an essential part of the business of mining. Every experienced operating man knows that the prevention of accidents is a major operating problem. The hazards of carrying on the work of blasting, haulage and the handling of materials underground, either by hand or mechanically, cannot be treated lightly. Particularly is this true because it is difficult to obtain adequate lighting underground; and roofs and walls are subject to caving or possibly bouncing. Moreover, coal mines produce explosive dusts and some mines give off explosive or irrespirable gases. Safety is no side issue in coal mining, nor is it a problem that can be solved readily and then forgotten. It is an important factor in each day's work.

Most operating men probably do not feel that the sole approach to safety should be made on a basis of cost. Safety essentially involves human existence, and life is not a problem in mathematics. But be that as it may, cost is one of the most potent arguments that the true believer has to set his cause aright to the unsatisfied.

Records generally will show a relationship between accident prevention and the cost sheet; that is, as accidents have decreased costs have decreased likewise at a given property. It can be demonstrated clearly that any expense incurred in behalf of safety is returned many times over through decreased compensation for injuries. Accidents are not a paying proposition.

The application of safety to coal mining operations does not require complicated or costly procedures. Common sense is fundamental. Good supervision, maintenance of friendly relations with the mine worker, good housekeeping, support and encouragement from the management—the cost of these is comparatively small, but, successfully employed, the return is great.

Safety concerns both management and worker; in fact, the worker in this day and generation is gradually assuming a greater responsibility than he perhaps yet has realized for the proper functioning of industry. Because safety is a human problem affecting in a measure all elements of industry, there is an opportunity for remarkable accomplishment through cooperation. Consulting the man on the job and by argument, evidence and persuasion, convincing him that the safe way is the better way to work, costs very little in dollars and cents. Confidence in a company and respect for its principles create an atmosphere where safety thrives.

(Concluded on page 63)

<sup>\*</sup>Pickands Mather & Co.

<sup>\*</sup> Vice President and General Manager, United States Fuel Company.

# The STATE MINE INSPECTOR Views SAFETY

#### Presented by

W. B. HILLHOUSE, Alabama

F. L. LOWELL, California

JOHN T. JOYCE, Colorado

ARTHUR CAMPBELL, Idaho

JAMES McSHERRY, Illinois

JOHN F. DANIEL, Kentucky

J. J. RUTLEDGE, Maryland

EDWARD DAVIS, Montana

WARREN BRACEWELL, New Mexico

JOHN J. DALY, New York

F. H. SHUFORD

MURRAY M. GRIER

North Carolina

M. J. HARTNEADY, Pennsylvania

E. A. HODGES

JAMES BERRY

Utah

J. TAYLOR

N. P. RHINEHART, West Virginia

A. H. FINDEISEN, Wisconsin

# OUTSTANDING PRACTICES Reducing Accidents

By W. B. Hillhouse\*

OR comparative purposes, a 16-year period, 1921 to 1936 inclusive, of production of coal per fatality in Alabama will be considered. The tonnage of coal produced for each fatal accident during the first half of this period was 171,317 tons, and for the latter eight years, 1929-1936 inclusive, 331,864, an increased production of 94 per cent in tons per fatality. The principal causes of the accidents were rock and coal falls, gas and dust explosions, haulage, electricity, and explosives.

During the period 1929-1936 there was an increase in production per fatality as follows: explosives, 772 per cent; gas and dust explosions, 474 per cent; falls, 58 per cent; haulage, 44 per cent; and electricity, 43 per cent.

The following practices were the largest contributors toward reducing these accidents during the past eight years:

#### EXPLOSIVES

The safe handling and storage of explosives and detonators, allowing only one day's supply underground, the decreased use of open lights, and discouraging the use of black blasting powder have resulted in an increase of 772 per cent in tons mined per fatality from explosives.

#### GAS AND DUST EXPLOSIONS

The State Mining Department makes complete examinations of gassy mines every 45 days. These inspections include air measurements, air samples taken and analyzed or the use of methane detectors on all returns and at occasional working faces. With this information, positive recommendations can be made with respect to the volume of air necessary regarding the safe percentage of methane in the mine atmosphere. The regular use of the flame safety lamp by

<sup>\*</sup> Chief, Department of Mines, State of Alabama.

fire-bosses as a protection to the workman before beginning his shift, similar examinations by some competent person before and after shooting, during the shift, replacing open lights with permissible electric cap lamps, the practical elimination of granular powder, and fortifying the above by suppressing the coal dust with water at faces and sufficient rock-dust applied throughout the mine, are largely responsible for the 474 per cent increase in tons of coal produced per fatality.

#### ROCK AND COAL FALLS

The 58 per cent increase in production per fatality from falls is the result of the adoption of timbering rules governing the spacing and proper capboarding, applying systematically to the entire mine, and in addition requiring the use of emergency timbers where necessary; and the daily visit of the mine foreman or an assistant to all working faces, directing the safety of workmen.

#### HAULAGE

Insistence upon the strict enforcement of state laws and company rules which prohibit such dangerous practices as running switches, coupling and uncoupling, mounting and dismounting

cars while in motion, improperly securing standing cars on grades, and the maintenance of clean and sufficient clearance between cars and ribs, has contributed largely to the increase of 44 per cent in tons mined per fatality from haulage.

#### ELECTRICITY

Due to the thinness of the coal beds in Alabama, 90 per cent of the electrocutions are from contact with the trolley wire.

The 43 per cent increase in production per fatality from electricity must be credited to the improvement in suspension and maintenance of trolley wires, properly shielded where men work or regularly pass under them, and where possible the installation of all signal wires and motormen's seats on the side opposite the trolley wire.

#### SUMMARY

The reduction in coal mine accidents in Alabama has been accomplished by complete inspections, thorough investigations and placement of responsibility for accidents, and through the combined efforts of the operating companies, their employes, the United States Bureau of Mines, and the State Mining Department.

we are devoting considerable space in our mine safety orders to this subject. With few exceptions, most of our mine fires have originated on the surface and have communicated to the underground workings or have caused smoke to penetrate the workings. Flammable buildings should be kept well away from mine openings, and in those instances where plants were built before the orders went into effect, proper fire-fighting equipment should be furnished.

The Value of STATE INSPECTION in Lessening METAL MINE ACCIDENTS

By John T. Joyce\*



John T. Joyce

THE State of Colorado recognized its responsibility for the safety of the metal mine worker by the establishment of a department known as the Bureau of Mines of the State of Colorado, with a commissioner at its head and four state metal mine inspectors, and dele-

gating to this department as one of its principal duties the examination of mines, mills, and quarries, as to safety and health conditions. This department has the power to order corrected under penalty of heavy fine all dangerous conditions found in mines.

By legislative act of 1911 the state was divided into four inspection districts for the purpose of a more rigid enforcement of accident prevention laws and departmental rules and regulations.

The Colorado Bureau of Mines, therefore, is vitally interested in the lessening of accidents in mines. Its inspectors examine into safety conditions at mines, mills, smelters, and quarries and make a diligent investigation and report of fatal and serious accidents, and recommend the employment of every possible and reasonable means to prevent their recurrence. We have recently compiled statistics on all accidents in and about metal mines, mills, smelters, and quarries in Colorado in eight-year periods since 1906 to and including 1935, the summary of which shows that at the time the act was passed in every 100,000 shifts worked in and about the metal mines of the state, a ratio of 2.212 men were killed. That has gradually been reduced in every eight-year period to the present year, which shows that the fatalities are now reduced to a ratio of only .937 in every 100,000 shifts, a decrease in fatalities of 58 per cent for

#### RULES Are An Essential TO SAFETY

By F. L. Lowell\*

THE Industrial Accident Commission of the State of California issued the first mine safety rules, effective January 1, 1916. These were revised as mine safety orders, effective January 1, 1921. These orders are again being revised at the present time.

The commission has had very good cooperation, in general, from the employers, who are becoming more safetyminded each year.

We believe that the first-aid training which the U. S. Bureau of Mines is giving to the miners of this state through their district mining engineer, Simon H. Ash, is largely responsible for a reduction in injuries, because it keeps the safety thought before the minds of the men at all times. Those mines that have safety committees that function properly show noticeable improvement in injury experience.

In mining there are some practices that can be improved, thereby eliminating some fatal and permanent disability cases. I have in mind the substitution of electric blasting methods in place of fuse blasting wherever possible to do so. We now have an improved type of allmetal delay electric blasting cap that is

much shorter than those that were formerly used. From a tabulation made of injuries, over a period of years, it is demonstrated that there are many ways in which men may be injured when using fuse; they sometimes wait too long when lighting the fuse and are injured by the explosion from the first hole; others are injured by returning to the face too soon after blasting when all of the holes cannot be counted and walking into a delayed explosion.

We have no quarrel with the fuse itself, but with the manner of using it. Where electric blasting is used, the men are in a safe location at the time of the blast, and the wires and switches are disconnected before men re-enter the working place.

Another safety feature might be mentioned at this time; namely, a uniform mine bell signal code for all metal-mining states, if such is possible. At the present time there is a difference in the basic signals of bell codes of the state of California and those of other states. It seems that these, at least, could be harmonized so that a miner going from one state to another would be familiar with these signals. Some discretion with these signals. would have to be allowed the operator of a mine in regard to signals for individual levels. There has been much objection among the operators of this state to the use of one bell for releasing the skip or as a signal to hoist.

The fire hazard in and about mines should be mentioned. In California mine fires have caused the loss of lives, and

<sup>\*</sup> Commissioner of Mines, State of Colorado.

<sup>\*</sup> Supervising Mine Safety Engineer, California Industrial Accident Commission.

the total period given. Serious and minor accidents hold closely to that ratio.

These figures, to my mind, demonstrate that the lessening of accidents in metal mines requires constant cooperation between mine operators, miners, and all other employes and continued inspection and guidance by an adequate force of

state mine inspectors.

The value of state inspection in lessening mine accidents is difficult to enumerate in units of dollars and cents only. It has a distinctive value to the industry, the public, and the kin of the injured far superior to any that can be measured on a direct cost basis. We cannot definitely say in any particular mine that a certain number of lives have been saved by the righting of recognized dangerous conditions or by safer equipment and practices, but we do know that by taking the state or county as a whole, dangerous conditions, unsafe equipment, and unsafe practices in mines will each year take their toll of life and suffering, and that the righting of such conditions and practices will inevitably save life. We know at the end of each year the number of accidents which have occurred and how many lives have been lost in our mines. but we cannot definitely say how many lives have been saved by inspection service; that many lives are thus saved is self-evident, which is borne out by the summarized figures submitted based on the law of averages. State inspection service results not only in the correction of dangerous conditions and practices but it also spurs the mine operator to increased thought and effort towards safety, and the miner to increased carefulness. Both miner and operator are repeatedly reminded by the inspectors that the state has a very definite interest in both the personal security of the miner and the continued successful operation of the mine. Also, the inspector through his visits to the numerous mines and through information collected by the department is able to suggest numerous measures which make toward safer and more economical mine operation.



Checking men in and out of mines by number, or by metal tag bearing his number, is important in case of mine fires or explosion. With this system in force, examination of the board at any time shows how many men are underground, and by reference to the book, in which each man's working place is recorded, indicates where the men are. It provides a valuable source of information

in case of emergency.

Classes in safety first, first aid, prevention of accidents and occupational diseases, prevention and fighting of mine fires should be organized to educate and stimulate the minds of employes to suggest ways to correct hazards and foster alert action in case of emergency. Reasonable rules and regulations should be promulgated, by an authority, to bring about uniformity and adherence to statutes and readily be adaptable to all classes of mining operations. Copies should be printed and distributed to all employes by the employer, who would require the employes to read carefully, familiarize themselves with them and cooperate in their enforcement. Infraction of rules should be met with disciplinary measures. In the case of habitual offenders, willful infraction would be considered sufficient cause for immediate discharge. A good workman is a careful workman, and one who will guard himself and the safety of his fellow em-

Bulletin boards with posters that show how certain accidents happen, and can be avoided, many times convey the message to those who cannot read. Danger signs, arrows pointing in the direction of exits, bell signal codes, block signals for haulage, stench warnings, in case of fire or emergency, all have their place

in the safety set-up.

In many mines a bonus system has been adopted with good results. The system is based on a contest. The foreman, shift bosses, and crews who have the least number of accidents are rewarded with prizes or bonuses.

Prevention of accidents is much better than the cure of injuries. Man is given only one life; when that is snuffed out, he is through. He is given but one body; when he loses any part of it, it is gone for good; there are no spare parts. The loss cannot be compensated with money.

In the last analysis each worker should learn to think safety and work safely, so as to acquire the safety habit and cooperate in bringing success to any safety-first program.

# SAFETY ORGANIZATION is Essential

By Arthur Campbell\*

MINING has its hazards, as have all other industries, and in consequence there will always be unavoidable accidents occurring in the course of underground operations, with accompanying injuries to workmen. Experience has demonstrated, however,

Arthur Campbell

that by far the greater number of accidents are not unavoidable, but are such as could be prevented by the exercise of a little foresight and caution by the workers themselves.

In Idaho, requirements for all operators, pertaining to operation and equipment of mines, are covered by statute. The inspector of mines, elected by the people, has among his other duties the policing of mines. It is the inspector's duty, at least once each year, to visit in person each mining county in the state of Idaho and examine all such mines therein as, in his judgment, may require examination for the purpose of determining the condition of such mines as to safety, and to promulgate reasonable regulations for safety and health of employes in such mines.

Safety organization is essential to sound business policy, as well as on

\*Inspector of Mines, State of Idaho.

humanitarian grounds. Industry should give safety first detailed study, and make the prevention of accidents and occupational diseases of paramount importance. Some authorities believe this kind of an organization should be maintained parallel to, but independent of, the operating department. I am of the opinion that safety organization and efficiency in production go hand in hand, and that industry should be required to take care of its cripples. Also, it should make provision to care for widows and orphans, as well as the sick and injured employes incapacitated while in the company's employ, instead of forcing those unfortunates to depend, as in the past, on public charity or meager returns from the workmen's compensation law.

Avoidable accidents, especially in mines, can be lessened by adequate inspection, education, discipline, and use of safety appliances, combined with proper organization. To arrive at the ultimate goal—to cut the avoidable accidents to a minimum—it is essential to have the cooperation of each and every member of an industrial organization, regardless of station. If a safety-first program is to be crowned with success, this cooperation is imperative. With a background of 25 years' practical experience in mines, I believe teamwork the most important factor in a program of this kind.

To emphasize safety devices and prevention of safety accidents and occupational diseases, we must have an organization under the direct supervision of competent inspectors. These inspectors, however, should have open minds, and readily accept suggestions and recommendations along safety lines.



Eliminate "SQUARE PEGS in ROUND HOLES"

By James McSherry\*

GREAT deal of attention is being paid throughout the country tocampaigns to equip workmen with safety shoes, safety hats, goggles, and other protective devices. And all this is very fine. Illinois is for this movement 100 per cent and our department is cooperating in every way to increase the success of these campaigns. I should like to see the day when every man who goes below ground is properly outfitted for his job. But all this new equipment and apparatus is not so much intended to prevent accidents as it is to lessen the severity of them. Granted we have the man who has the mental and physical qualifications for the job and who, too, is properly equipped for his work, the big question is, of course, how to keep this workman from injuring himself and his fellow employe. In answer to this question I can perhaps put forth no theory that has not been expounded countless times before.

Teach the man his job.

See that he has a thorough knowledge of the hazards of his work.

Train him in first-aid to the injured and see that there is the opportunity for review and practice of this subject.

Insist that all injuries, regardless of their degree of severity, be given immediate attention.

Provide safe tools and be sure that men know how to use them.

Have round-table discussions on safety and accident prevention and make it compulsory for foremen to attend these meetings.

Keep attractive safety posters conspicuously displayed and place a premium on safety by rewarding the safe workers in your organization.

"Sell" safety to the men. Adopt a code of safety rules and

see that they are strictly observed. Fire the man who plays around on his job-he is certainly not qualified "mentally" for the business of mining.

Old stuff? Yes! All of the above and other fundamentals have been written about and discussed since mining men began to interest themselves in this business of safety, but I for one have long ago despaired of anyone's ever coming forward with a panacea for accident ills. Until-if ever it happens-some genius appears with such revolutionary ideas and all we have learned about safety will be obsolete, I think we had best keep our necks bowed and drum away on the fundamentals we have learned. The operator who thinks these fundamentals are not bringing results if properly applied and who prefers to wait for entirely new ideas will find his accident costs increasingly heavy; and the workman who persists in the belief that safety is "all the bunk" had better look to some other profession for a livelihood-he may live longer in another line of work and prove less of a hazard.

With all the progress that is being made along the lines of safety promo-tion and accident prevention, I believe there is still one phase of the movement that a great deal of attention should be paid to, i.e., the physical fitness of the men who work in and around the mines, particularly those who are at work below. I know of no industry which calls for as great an amount of physical and mental alertness on the part of the men who perform the work than does mining. If there were a concerted and general movement to eliminate the "square pegs in round holes" I am certain the mining industry would show very rapid and marked improvement in its accident

#### Some SAFETY SUGGESTIONS and RECOMMENDATIONS

By John F. Daniel\*



John F. Daniel

T IS very evident, when comparing the safety records of the present time to the records of several years back, that we have reduced the number of accidents as to deaths and time lost, to some extent, yet the results are far from satisfactory.

Mostly, of course, the answer is, "The human factor." Indi-

<sup>o</sup> Chief, State Department of Mines and Minerals of Kentucky.

vidual companies, in some instances, have performed competently, while others are woefully weak along safety lines. We have learned from long experience that, to accomplish much in safety, it must be kept before the various officials and employes constantly. To do this is most difficult. We have experimented with many safety problems in order to be able to recommend, or to advise all concerned the most logical program from which the best results might be obtained. However, we always end with the same answer, "The human factor," which in plain terms is the mental attitude of mine organizations, or the lack of being able to keep safety in mind while doing the job at hand.

This is as true of the official staff as it is the rank and file of employes, and while one plan or system might work with good results at one operation, it might be a misfit at another operation. and our experience has indicated, conclusively, that a safety program that will get excellent results at one place might be a failure at another place, but there are a few items of importance that must necessarily be taken into account in any safety program. Some of these are as follows:

- 1. That all employes be trained in first aid to the injured.
- 2. That all companies employing over 150 persons have besides a competent foreman a sufficient number of supervisory assistants, and employ a regular safety inspector.
- 3. That all companies employing less than 150 persons have, along with a competent foreman, a sufficient number of supervisory assistants to properly examine and advise as to the work done in the proper manner.
- 4. That meetings of the supervisory staff be held at least once each week, depending upon the efficiency of said staff and their ability to sell safety to the employes down the line.
- 5. That a record of each and every accident be kept, so that the supervisory assistants will be charged with the accident, as well as the foreman.
- 6. That supervisory officials be given complete authority under the direction of the foreman for the safe manner in which the work to be done must be handled.

Our experience in Kentucky has been that many fatal accidents have occurred due to poor supervision, and the attitude on the part of the foreman and his superiors that matters such as tonnage and cost are more important than safety. We are convinced that if the mental attitude is right in any mine organization, that safety will prevail and results will be obtained.

A mine official who is big enough to handle his job usually has the confidence of the men under his direction, and if so,

<sup>\*</sup> Director, Department of Mines and Minerals,

can soon establish a safety program that is most adaptable to his situation. While his program might differ considerably from his neighbor's, his chances for a good record are better than even.

In conclusion, I wish to state that we do not have any fixed or definite one-way plan to promote safety, and we usually suggest several safety plans; then leave the matter to the mine organization to decide on which plan will best fit their requirements.

# EDUCATION—SUPERVISION—DISCIPLINE

By J. J. Rutledge\*



J. J. Rutledge

OT long since, the writer, while seated in the obby of a hotel along-side the Director of a State Department of Mines, heard him ask the head of a large coal company, noted for an exceptional safety record, "Mr. Brown, why is it, with all the time and effort that we state mine in-

spectors exert, that we still continue to have numerous mine accidents, many of them fatal ones?"

"Well, Chief," replied the coal company head, "it's because so few of the heads of coal companies are 'safety-minded'." Just then the operator was called to the long-distance telephone and as he did not return at once to our little group, the dialogue was not continued, but the writer has thought a great deal about the remark since it was made, and the statement, in the writer's opinion, is absolutely true. When the men at the head of our coal companies-large and small, but especially the small ones, for our larger coal company officials are nearly all safety-minded, although they have many different ways of expressing such convictions-when all the head officials of our coal companies wish mine accidents to decrease, then such accidents will decrease.

And yet, the coal company heads are not entirely to blame in the matter of accidents. Recently a coal operator, a former miner, and a good one, who had saved the money that he earned by hard manual labor in coal mines and invested it in mines and had become an operator of importance, remarked to the writer, in a passionate outburst over the frequency of mine accidents, "When it comes to the matter of compensation, I get so mad at the outrageous costs that I believe it is better to quit thinking about compensation and forget about it!" These days a mine superintendent has enough to worry about, in this man's

 Chief Mine Inspector, Maryland Bureau of Mines.

judgment, without bothering about mine accident compensation costs. It makes very little impression on us when the average coal operator complains about the high cost of accident compensation; he states that it is costing his company 8 cents per ton, or 10 cents even, but if the operator of a 500-ton mine declares that his accident compensation cost is \$50 each day that the mine operates, or the head of a coal company producing 1,000 tons per day states that his accident compensation cost for each day that his mine is in operation is \$80, then we at once sit up and take notice, for one-half of this compensation cost would be a handsome profit for each of the companies.

But can the compensation cost be reduced if the coal company officials and the mine employes, especially the miner or loader, are not interested? writer believes that it can be-and howby the enactment and strict enforcement of state mining laws and regulations; by the employment of competent state mine inspectors appointed under state civilservice laws and rules; by the hearty interest of all mining company officials in mine safety; by strict supervision of all compensation work-conscientious supervision; by resisting to the utmost all unjust claims for accident compensation, by prosecuting those who make unjust claims, as well as those companies that neglect to carry accident compensation insurance; by requiring that injured employes be returned to work as soon as they are able; by reducing to the smallest possible amount the participation of the physicians and surgeons and lawyers in the compensation awards.

If accident compensation is an item in the cost of producing a ton of coal, and most coal operators will concede that it is, then all mining company officials, from the president and general manager of the coal company down to the mine foreman and section boss, should be required to exert their utmost to see that this item of mine cost is kept as low as possible. This is but common business sagacity. But what good will it do for one coal company (usually a large one) to employ safety engineers, to require 100 percent first-aid training, and to do the many other acts that mine safety requires, if a mine employe who has been discharged or disciplined for violation of state mine laws or coal company regulations can go to the adjoining mine of another company (generally a small company) and secure another and perhaps a better job, and this latter company is beneficiary of the same accident fund as the larger companies.

There are four elements to mine safety: (1) state mine law, (2) state mine inspector, (3) coal company officials, and (4) mine employe, especially the miner at the working face. Unless all four of these agencies cooperate in the work of mine safety, mine accidents, especially fatalities, will not be decreased.

As a result of an intensive study of fatal mine accidents, particularly those

due to fall of roof and sides, the writer is of the firm conviction that if only items 3 and 4 are interested in the matter of prevention of fatal mine accidents-yea, if only item 4 is interestedfatal mine accidents will decrease, perhaps be entirely eliminated. When the miner himself becomes INTERESTED, then accidents decrease, and why should he not be interested? He is the one among the four who is the most interested in the matter-it is his life that is at stake-it is his life that is too often lost or his body injured by reason of his neglect to take an active interest in mine But how shall his interest be safety. aroused and maintained? By prize awards when safety is exercised and good records are secured-by penalties for violation of mining laws and safety regulations?

The writer would urge as the three requisites in accident prevention: (1) Education; (2) supervision; and (3) discipline. By education is indicated instruction in the state mine laws and mine safety regulations, first aid and mine rescue; (2) by supervision is meant the careful inspection of mine working while the employes are at work; and (3) by discipline is meant the strict enforcement of all state mine laws and company safety rules.

## The IMPORTANCE of being SAFETY MINDED

#### By Edward Davis\*

THE teaching of safety first is based on the fact that most accidents are preventable. Therefore it is evident that cooperation between employers and employes is necessary in order to reduce their number.

Most employers and employes sincerely believe that safety first pays in dollars and cents and in human happiness and well-being. But, none the less, as already stated, most accidents are preventable. Sometimes they occur on account of the negligence of the employer who may be more concerned with production than with safety. But generally they are due to the employe having failed to take the regular and necessary precautions. Being subject to human limitations, men forget, their minds wander away from the job, and the result often is a serious or fatal accident. Furthermore, in this machine age jobs are scarce and men are expected to work at top speed. Workers are divided into groups or units and the workers in the units with the highest production set the pace for the rest until the capacity of the machine becomes the goal in production.

Coal mining being a hazardous occupation, accidents cannot be entirely eliminated, because there are many things that can take place that cannot be anticipated. Therefore, our problem has to do with accidents that ordinary foresight can prevent. This narrows down our

<sup>\*</sup> State Coal Mine Inspector of Montana

area of accident prevention to mine supervision and the activities of the men employed in the different classifications.

Our problem is to educate mine officials and workmen to the point where they can be said to be safety-minded.

Too often safety first education is limited to the mere repetition of the phrase as a slogan. This is not enough. All mine workers and mine officials are familiar with the slogan, but far too many of them are not safety-minded.

Safety - minded officials count the money well spent that contributes to the greater safety of the workmen. They investigate and keep records of all accidents and see to it that unnecessary and dangerous practices that lead to them are discontinued. They do all that lies in their power to comply with and enforce the safety provisions of the mining laws.

The safety-minded workman sizes up his job and figures out as far as he can the various ways in which he may be injured. He will not take chances by doing the things that are prohibited. The thing uppermost in his mind is his own safety and the safety of his fellow workers. He is familiar with the safety provisions of the law and he does not violate them. He knows that safety is better than compensation. He knows the importance of sizing up his job as a means of accident prevention. He and most of his fellow workers and mine officials know it; the rest must be educated.

In the main, the problem of accident prevention is that of dealing with mine officials and workmen who are not safetyminded. And it is with these that the mine inspector can do useful work by seeing to it that no one is allowed to work under dangerous conditions. The mine inspector should not allow anyone to work under conditions that he, himself, would not work under. When he finds men working under dangerous conditions, or officials permitting dangerous conditions to exist, he should, in addition to enforcing the law, give a lecture on safety first that would leave a lasting impression.

There should be no passing of the buck allowed when men are found working under dangerous conditions. By this we mean that the Joy loader operator, the machine runner, the trackman, etc., be made responsible for the safety of his working place. If the timbering has not been done by the timberman in the unit, then it must be done by the men in the next classification who follow the timberman, and it must be done before they proceed with their regular work. Each workman must be made to realize the responsibility, for his own safety rests primarily upon himself. Instructions to this effect with quotations from the mining laws, supplemented with safety suggestions for the different classifications, should be printed in booklet form and given to each workman.

When accidents are investigated, workers' representatives should participate with the mine officials and report the findings to their local unions with a view

to prevention of similar accidents. The importance of the discussion of accidents between mine officials and workmen cannot be overestimated as a means of education in accident prevention.

Education, organization, and cooperation will help to make mine officials and mine workers safety-minded and go a long way in reducing the number of accidents in our coal mines.

# Safety EDUCATION and COOPERATION

By Warren Bracewell\*



DURING the past generation, many methods have been used to reduce the number of accidents and fatalities that occur in all types of mines. Some of these methods have been more or less successful in reducing accidents, while others have completely failed

their mission. In my own experience, the reduction of mine accidents to a minimum has been accomplished by safety education,

Safety, in all its many phases, must be taught to the beginner. Despite the modern machinery used in our mines today, men still are the controlling factors in the operation of any mine. Men are all human and cannot be controlled like machinery. It is this human element that we are thinking of as we try to make our mines safer, and for this reason the employe must be educated in safety from the day he enters his mining duties.

It must be remembered that the cooperation of the operator with the employe, and equally, the cooperation of the state and Government inspectors with the mine officials is very important in the constant campaign to make our mines safer for all connected with their operation.

Safety should be, and usually is, the primary consideration of the operator. This should mean that all the safety devices possible be installed in the mine. New devices for the promotion of safety are constantly coming on the market, and the operator should take advantage of these improvements, after ascertaining that the new devices have proven their worth. The operator should also see that all devices are maintained in good working condition, and a check at certain regular intervals should be made of these conditions.

However, the operator cannot maintain safety in his mine by himself. He must have the whole-hearted cooperation of his employes, because they benefit by

\* State Inspector of Mines, State of New Mexico.

health and happiness through these safety devices while the employer benefits by less compensation. Therefore, it is necessary that both parties understand the how and wherefore of their operation in order that they will take proper care.

In this campaign, we are indeed fortunate in having the assistance of the United States Bureau of Mines. This branch of the Government has a corps of highly skilled and well-trained men in the art of instructing the principles of first aid. These men are equipped to give intensive training in safety and are extremely willing to cooperate.

Inasmuch as these skilled men are available, it is the duty of the mine operator to provide comfortable meeting places and the necessary material for the instruction of all men. It is also the duty, and this should be made mandatory if possible, of every employe to attend these meetings.

It is impossible to impress too much the absolute necessity of training the beginner in all safety measures. One could draw a simile here of mine safety laws and traffic laws. The police in every city lay down certain rules regarding the movement of vehicles and pedestrians; but if the man crossing a street crosses at the wrong time and the wrong place, an accident may happen. That man, the jaywalker, is the person that needs training. So in the mines, the jaywalker, the untrained beginner, must be taught.

Constant cooperation between mine officials, inspectors and the operator's employes cannot be stressed too heavily. All modern safety devices should be installed and kept well maintained. The employe should give his employer complete cooperation, and should always take advantage of all the schooling offered him.

If the above methods are followed, I feel sure that the number of accidents in mines in the United States will be kept at an absolute minimum.

# What Can Be Done to INCREASE SAFETY in MINES?

By John J. Daly\*

N account of a large number of mines in New York State being operated by mechanical haulage through inclined shafts, the angle of inclination varying from 30 to 80 degrees, the department investigated the practicability of providing an efficient safety catch for man cages in which miners ride into and out of the mines.

Contact was made with a large elevator company and an exhaustive study of design to fit actual working conditions in the field and the construction of a

<sup>\*</sup> Supervising Mine and Tunnel Inspector, Bureau of Mines, Tunnels, Quarries and Explosives, New York State Department of Labor.

safety catch was completed. Extensive tests were made of the safety catch for its effectiveness, subjecting the device to an abrupt stop after a loaded cage had been permitted to travel at a high rate of speed for 500 feet. On dry track stringers the safety catch proved satisfactory but failed on wet track stringers, the safety catch after gripping cut itself free.

To insure the safety of miners riding into and out of the mines in cages in inclined shafts, this bureau, with the cooperation of all the mine operators, now provides rigid daily inspection of all hoist ropes by a competent and responsible rope man whose sole duty is to inspect the hoist ropes, hoist engine, and safety devices. In addition to daily inspection, all hoist ropes are wire-brushed, cleaned and oiled for their entire length once each week.

To date no suitable safety catch has been developed to operate satisfactorily on wet track stringers in inclined shafts.

#### EXPLOSIVES

Safety could be increased in the transportation of explosives from surface magazines to the magazines in the mines. It has been found by inspection that large quantities of dynamite and blasting caps are stored for hours in the mine shaft houses and when these explosives are finally lowered into the mine they are in most instances not moved to the mine magazines but are permitted to be stored in cars on a side track on a main haulageway.

Orders have been issued to discontinue this unsafe practice, but this condition is present time and again due to the pressure for production when all safe mine practices apparently are put aside.

Again, there is no supervision as to the quantity of explosives a miner may requisition, what conditions under which he stores and uses such explosives and his disposition of any explosives remaining unused. This is caused by the contract system of mining and this hazard has been in part corrected by this bureau's insistence that each miner using explosives be provided with separate and locked magazines for dynamite and blasting caps. A daily record should be kept of the explosives that each miner

All charged holes should have sufficient stemming material and should only be tamped with a wooden rod.

All blasters should be furnished approved crimpers to crimp caps on fuse, and should also be furnished with approved circuit testers to test wiring circuit and electric blasting caps.

No open-flame lights should be permitted in a magazine or while workmen are opening dynamite or blasting cap containers, preparing charges, or loading holes.

When explosive containers are opened, the boards with nails protruding should not be left lying around so that a workman can step on a nail and injure his foot. All empty containers, paper, and sawdust should be immediately removed from the mine and destroyed.

No person should be permitted to smoke while handling explosives or carry explosives in his clothing.

When firing by the electric method, no blaster should be permitted to use two different brands of blasting caps in the same circuit. Many misfires have been caused by this practice.

#### PROPER SUPERVISION

Operators should make regular inspections of mines instead of relying on persons under their supervision. We have known instances where orders were issued by this bureau and the operator seriously objected to carrying out the orders because the superintendent or foreman told the operator that the orders were not necessary. On our recommendation that the operator make an inspection of the mine, it was found that the orders were necessary, and they were immediately carried out. The operator then requested that the state make more frequent inspections.

It has been our experience that in mines where there have been a large number of accidents there has been a lack of proper supervision. The supervisory force should be compelled to inspect all working places daily. The roof and posts should be inspected the first thing in the morning. All loose roof should be barred down and the posts made secure before the men are permitted to start work.

Cars should be loaded so that rocks will not roll or drop off cars and possibly injure some workman.

Workmen should not be permitted to push cars with their hands on the top edge so that loose rock can roll on their hands.

Every new employe should be thoroughly instructed as to the hazards of his job before he is permitted to start working.

Periodical temperature, humidity, dust, and gas tests should be made by the operator, and the persons making the tests should be furnished the proper masks and testing devices to make such tests.

When necessary, all workmen should be furnished with goggles, respirators, and protective hats, and the foreman should see that they are used instead of being worn as an ornament,

Care should be exercised in the selection of safety inspectors and safety engineers, who should have sufficient training and experience for the positions. In some cases we have found that the sole duty of a safety engineer has been to post notices on bulletin boards.

Accidents in the mining industry would be greatly reduced by the whole-hearted cooperation of the operators with this bureau in carrying out the provisions of the labor law and the industrial code mine rules and the cooperation of all employes with the operators. Any employe who violates the provisions

of such law or rules or the operator's safety regulations should be penalized by being laid off for a certain period and not permitted to return to work until he shows a willingness to be a safe worker.

INCREASING SAFETY in North Carolina Mines and Quarries

> By F. H. Shuford\* Murray M. Griert



F. H. Shuford

UR Safety Rules for Mines and Quarries require all hoisting and haulage equipment to be of ample capacity and of a standard design. A number of the small operating mines still use make-shift hoist equipment although the use of such make-shift equipment is be-

ing eliminated as rapidly as possible. We feel that the replacement of out-moded and unsafe equipment by equipment which is designed to do this particular work has been a very important factor in reducing the number of accidents in our mines and quarries for the year 1936 over the large number of accidents which occurred during the year 1935. We still have small mines which are using worn out automobile engines for hoisting, but these mines are becoming the exception rather than the rule as was the case several years ago.

We require hoisting and haulage equipment to be inspected each week and a written report made and filed for the mine inspector on his regular routine inspection. This requirement has enabled operators to discover broken or loose parts of their equipment which has doubtless eliminated many accidents. If this inspection was not required by this department, it is very probable that a large number of small mine operators would never take the trouble to make such frequent inspections of their equip-We feel, therefore, that this simple requirement has been an important factor in eliminating accidents.

We are continually urging the use of protective clothing in all mines, such as goggles, respirators (until an approved system of dust elimination has been adopted), hard hats and safety shoes. Our first job is to sell the officials on safety and convince them that protective clothing is an important factor in the elimination of accidents. After we convince the management of this fact, we then stress the point that it is essential for the employers to instill in the minds of their employes the importance of the use of this equipment. Although

<sup>\*</sup> Chief Inspector.

<sup>†</sup> Mine Inspector, North Carolina Department of Labor.

we have the authority to enforce safety regulations of this kind, and have been forced to use this authority where the cooperation of operators cannot be obtained, yet we find that our process of education has proven far more effective than all enforcement measures combined. When the cooperation of employes cannot be secured it is necessary for the management to resort to penalties in order to enforce their requirements concerning the use of protective clothing and safety equipment. If necessary we believe it is better to discipline one employe, where he cannot be handled in any other manner, than it is to permit employes to assume that the use of protective clothing is simply a matter of choice and relatively unimportant. Such laxness will inevitably result in more frequent accidents.

Explosives always present a very serious hazard under any circumstances. However, if standard practices, as recommended by the Institute of Makers of Explosives, are observed in the handling, storing, transporting and use of explosives, these hazards are minimized. In our inspections we always go over these standard practices very thoroughly with the "shot-firer" and his assistants. We observe that the younger miners have learned to respect explosives much more than the older miners. As a result accidents caused by the improper use of this material is on a steady decrease.

When a mine inspector is intent on the hazards which are peculiar to this industry, it is easy for him to overlook the guarding of machinery. It is just as essential, however, for machinery to be guarded in and around the mines and quarries as it is in manufacturing plants. In our mine inspections we try to emphasize the importance of guarding all pulleys, belts, rods, gears, sprockets, chains, blades or other moving parts of machinery, except points of operation. We require this guarding to be done according to standard rules issued for the mining industry. We are very careful about proper wiring for electric lights even though the voltage used may be very low. We find that many people do not realize the great hazard incurred when handling a poorly insulated low voltage line when standing on wet ground.

Since many mines are located in isolated sections it is important to have at least one person trained in first aid application. Even though there may be only four, five or six employes this training should not be neglected, as it is of even greater importance in these small mines than it is in the larger mines where medical assistance is accessible. With a man trained in first aid available in every mining operation it sometimes happens that a life is saved if a serious accident occurs. Many minor injuries are prevented from becoming major ones by immediate attention to a cut, burn or other injury which is subject to infection and which is so frequently neglected. In cooperation with the United States Bureau of Mines we are giving training in first aid and mine rescue work in all min-

ing communities where interest has been aroused. Until recently greater interest has been displayed by the larger mines; however, many requests for this training are now being received from the small operators.

Regular safety inspections play a definite part in any safety program. We suggest to the officials that they have a different employe make a general safety inspection each week and submit a report to the superintendent. This system has proven quite effective in uncovering hazards that were previously not known to exist. We urge that weekly safety meetings be held with the manager, superintendent, foremen, and safety engineer present. We further urge that safety meetings of all employes be held once each month with attendance required. These general safety meetings must be participated in by the employes themselves if interest is to be maintained, and if good results are to be secured. If employes feel that they have a definite part in a safety program, and if they realize that their ideas and suggestions are given serious and thoughtful consideration by officials who are anxious to eliminate all hazards, then, and not until then, will any safety program be a success and the accidents in this industry reduced to the lowest figure possible.

#### ACCIDENT REDUCTION Imperative to Efficient Mining Industry

By M. J. Hartneady\*

MINING, the same as every other industry, carriers with it an employment risk. One of the fine tests of our experience and judgment as mining men is to be able to determine definitely the accidents which occur as a result of employment risk and those which occur as a result of some other cause.

Those occurring as a result of employment risk are termed unavoidable and all the others are termed as avoidable accidents.

I need not tell you, Mr. Operator, that one of the most vital things to the well being of the coal mining industry is a lessening of the number of these avoidable accidents. About \$4,000,000 were paid out by your company and other companies last year in accident compensation.

When an operator with a record that shows no improvement with the passing years tells you, "We are doing everything to make our mines safe," he is admitting defeat. To reduce accidents, two things are absolutely necessary: Education and discipline. The best way to educate the ignorant employe and discipline the careless employe is through

adequate and intelligent supervision on the part of the official force.

The interest or lack of interest shown in these things at the top will trickle down through the organization. The type of safety program enforced is a reflection on the operator's attitude toward safety.

During the latter part of the year 1931, the Pennsylvania Department of Mines inaugurated a safety campaign in the anthracite region. The success of this campaign, which certainly produced results, can be attributed chiefly to more and better supervision of the working faces. Stress was placed particularly on the prevention of accidents resulting from roof falls. Accidents from this cause are controlled, to a large extent, by official supervision of the working faces.

During the five years—1932 to 1936—the different coal companies devoted untiring efforts to prevent roof-fall accidents. The officials were required to make a thorough examination of the roof in each working place, and if a faulty condition were found, they were required to remain sufficiently long to supervise within reason its removal. Comparing these five years with the preceding five, and considering all factors entering into the question of accidents, the period of years 1932 to 1936 stand out as the banner years in the history of anthracite mining.

The following statements show what has been accomplished:

- 8,056 workmen were kept out of the hospitals in the anthracite region.
- 2. There were 267 lives saved.
- 3. The state, coal companies, and insurance companies saved \$2,-997,107 in compensation.
- The production per fatal accident was 33 per cent better than the average for all the years since 1870.

#### SAFE PRACTICE in Utah Coal Mines

By J. Taylor\*



J. Taylor

FOR the past several years, in Utah, the Industrial Commission has required all machine runners on coal-cutting machines, operators on coal-loading machines, and drillers on drilling machines to be furnished with magnetically locked flame safety lamps and

taught how to use them in testing for gas.

All men on coal-loading and coal-cutting machines are ordered to leave their

<sup>\*</sup> Secretary of Mines, Department of Mines, Harrisburg, Pa.

<sup>\*</sup> State Coal Mine Inspector, Industrial Commission of Utah.

machines out by the last open cross-cut where the ventilating current is good until they have examined the faces for gas, bad roof, etc. If any gas is found, they danger the place off and notify the face boss or foreman in charge. If no gas or bad-roof conditions are found, they proceed to the face for operating purposes. Each man on these machines makes an occasional test for gas during the cutting or loading period.

All drillers are requested to test for gas before commencing to drill holes, and make an occasional test for gas until all the holes are drilled at each working face. The same rule which applies to the operators of other machines also applies to all drillers. If any gas is found, the place is dangered off until the gas exception has been cleared and

the place made safe.

We also try to keep electric permissible equipment at all faces for coal cutting. loading, and drilling in gaseous mines, and also recommend that electric permissible equipment always be purchased to replace worn out equipment and to have all electric permissible equipment examined to determine its permissibility as often as possible by a competent electrician and reported in a daily report book kept for that purpose.

Aside from the above methods, in all districts, gaseous or nongaseous, where the coal is worked to a height of 9 ft. or more, we have face bosses in charge of the districts where coal-loading machines are used, and they are furnished with magnetically locked flame safety lamps for gas-testing purposes.

All working places are examined and all loose coal is taken down and the places made safe before the coal-loading machines begin to load coal.

#### SHOT-FIRING METHOD

In some of the mines classed as gaseous and where considerable dust is made after firing shots, the drill holes are made to parallel the ribs of rooms and entries. All holes are drilled to allow a few inches of clearance to avoid bootleg shots. The machine cuttings or bug dust is cleaned from under the kerf and all working places wet down by being sprinkled.

The shot firers examine all places for gas before the holes are tamped. Permissible powder is used exclusively for blasting coal, and the permissible amount of powder is used for each shot. The faces are shot in four sections for the purpose of giving each shot all the freedom necessary.

All of the places are examined for gas and sprinkled before and after shooting

each round of shots.

All shot firers are certified men and have small districts because of the many times it takes to shoot each face. They use the small electric hand batteries for firing shots.

The above method is very safe, and the coal companies make a much better marketable coal; a more thorough inspection is made by reason of the shot firers having small districts.

Now, in conclusion of this small article, if all of the men mentioned above make use of their magnetically locked flame safety lamps for what they are meant, there is absolutely no danger of igniting any accumulation of gas at the working faces in any mine.

SAFETY Is Primarily the PROBLEM of the Executive

By James Berry\*



progress made towards improved safety standards in the mines of Ohio during the last six years, statistics show substantial results have been made, although there is still very much to be accomplished. Very nat-

N reviewing the

urally, one charged with the responsibility of accomplishing this purpose studies the situation in an effort to find what activities have contributed toward improving conditions, with the idea of applying these principles more diligently in order to accomplish the greater task which lies ahead.

I believe that the most important factor in achieving substantial progress is convincing the executive head of the operation that the occupation is not inherently hazardous and that proper attention can eliminate a very large percentage of these accidents that were formerly believed to be inevitable. When this executive head is so convinced, and makes safe practices a major factor in his operating policy, he will place the responsibility for mine accidents upon his supervisory force at the mine. These men, who are in direct charge of employes, must be thoroughly sold on the idea that their mine can be safely operated. They must then conduct a constant campaign of education among the employes, keeping always before them their undeniable duty to contribute their bit toward protecting themselves and their fellow employes from accident.

Some years ago it was a very ordinary thing to read in the paper of major disasters in the bituminous coal mines resulting from explosion of gas or dust and costing the lives of hundreds of miners. Intelligent study, and particularly research work of the United States Bureau of Mines, proved that these disasters were avoidable. Methods of avoidance were thoroughly demonstrated.

It took a strenuous campaign of education to convince the industry of this fact, but since it has generally been accomplished, deaths from gas or dust explosions have been practically eliminated

\* Chief, Division of Mines, State of Utah,

in mines where the suggested remedies have been applied. Today there are many more people killed by gas explosions in the home than in the mines.

If the same intelligent study of the causes of accidents from roof falls and haulage were made; if the same intelligent methods of preventing them were demonstrated; and if these truths were as thoroughly demonstrated as the principles of protection against explosion hazard, our mine accidents would be immediately reduced by more than 50 per

Major explosions have received the first and principal attention because they are spectacular. They receive very much newspaper publicity. The human interest story of hundreds of relatives sorrowing at the pit mouth waiting for their loved ones to be brought out of an explosion-torn mine brings a tremendous public appeal for a remedy, while very little attention is paid to the thousands of humble miners who are killed and maimed annually, singly or in pairs, through roof falls and haulage accidents. I am sure that everyone in the industry knows that the collective grief of these victims and their relatives and the economic loss as a result of these tragedies is far greater than that ever suffered through explosions, because their number is far greater.

This situation, it seems to me, offers the bituminous coal industry a challenge which it cannot afford to ignore.

#### CARE and HANDLING of **EXPLOSIVES**

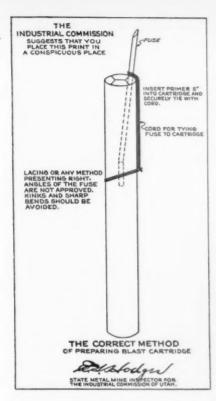
By E. A. Hodges\*



ARE in preparing and safe handling of primers, and the proper loading of the bore holes are very important in the prevention of accidents from missed holes and contacting primers with open lights and other sources.

It is essential for successful blasting that the fuse be cut straight with a clean, sharp knife and immediately capped and crimped. They should be carefully coiled and placed in suitable cabinets at convenient places until ready for use at the face. should never be laid on the ground or hung on nails. Fuses cut in a slanting manner and crimped in a high temperature will frequently cause a misfire, as the slanting-cut fuse admits of a small air chamber in the barrel of the cap, and air flowing ahead of the burning powder will build up a compressed air chamber,

<sup>\*</sup> State Metal Mine Inspector, Industrial Com-mission of Utah.



preventing the spark from the spitting fuse to explode the cap composition,

Where primers are sealed, only approved sealing compound should be used, and they should never be hung up to dry, as the sealing compound will likely seep through the crimp vent and seal off the spitting end of the fuse. They should be laid in a horizontal position to dry.

Cartridges should be made up by straight end priming and loaded into the bore hole the straight way. Missed holes often result from reverse loading by inserting the cartridge in the bore hole with the closed end of the cap facing the collar of the hole. This method is apt to break the fuse tape; also it causes the right angle turn on the fuse to become scuffed while being inserted into the bore hole and not only breaking the powder train but permitting water to seep into the powder, causing a misfire.

Lacing the cartridge in my judgment is poor practice, the necessary bendingand particularly if the fuse is cold-will likely break the tape, also disturb the powder train, which is likely to result in a misfire, and again it is my belief this method is responsible for many bootlegs, because of an extra width of fuse on either side of the cartridge the miner does not contact the cartridge with the first stick of powder placed in the bottom of the hole, due to tightening of the cartridge on account of the extra width. This leaves an air pocket between the first stick and cartridge, causing a bootleg.

If side priming is done the primer must be well taped with friction tape.

Double priming is dangerous practice. Premature explosions are liable to result from such practice.

The accident records of the State Industrial Commission will show that since the above explosive regulations were introduced into the mines of Utah, accidents from explosives, which were of frequent occurrence, are now almost negligible.

#### Four MAJOR FACTORS in a SAFETY **PROGRAM**

By N. P. Rhinehart\*



N. P. Rhinehart

ENERAL programs or safety campaigns are necessary in order to perpetuate safety at a mine, but these movements fail too often for lack of specific goals.

At every mine there should be at least one man whose job would be to keep adopted

safety measures alive and always be alert to new precautions.

A slow, cautious building of a safety movement is more successful than the hastily applied but untried program,

If you desire to make a definite step for safety, or if you want to improve a safety movement already functioning, the following outline should be in force or adopted in part or as a whole:

1. Training.

- a. Train all employes and officials in first aid.
- b. Train all officials (present and prospective) in mine rescue.
- c. Job train all officials.
- d. Job train all employes.

2, Clothing.

- a. Have all employes and officials wear hard hats.
- b. Have all employes and officials wear hard-toed shoes.
- c. Have employes, while striking or grinding, wear goggles.

3. Prevention.

- a. Permit only experienced persons to operate machinery.
- b. Use signals for operating machinery.
- Use only permissible explosives. d. Rock-dust thoroughly all parts of coal mines.
- e. Provide an abundance of fresh air by properly ventilating mines, not only for breathing, but also in sufficient volumes to remove dust in suspension and gases.

- a. Exercise strict but reasonable supervision.
- \* Chief, West Virginia Department of Mines.

- b. Adopt a minimum number of safety rules and enforce all of them.
- c. Develop an attitude of tolerance between officials and employes.

This program gives four general definite steps to be taken as direct action preparatory to inaugurating a safety campaign to suit the individual jobs at a particular mine; viz, proper training, proper protective clothing, proper preventive measures, and proper policy for dealing with employes.

Records show that the safest man is the one with a long service record. This proves that training in the best method of doing a job also develops safer ways of doing the same work. It is, therefore, easily seen that no time should be lost in making available to the employe, by job training, all of the knowledge you have gained in the operation of your

The quickest way to prevent injuries is by wearing protective clothing The man who is properly dressed has the usual pride every worth-while human being possesses and becomes "safetyconscious" with the knowledge that he is wearing safety clothing.

It is futile to start a safety campaign until the company has applied every conceivable preventive measure affecting the safety of the employes. The employes know if the company is sincere in promoting safety. The action the operator takes to provide safe working conditions governs the employes' confidence in the undertaking. The company must by all means make the first step to correct potential hazards, in order to build the basis for cooperation in all safety move-

The policies adopted by the company in dealing with the employes are the secrets to the continued success of all campaigns, as long as measures be applied successfully.

Satisfied employes, economical operation, and safety are always found in those well-regulated mines or plants where strict but sane discipline is in

Safety can and will be increased only when action becomes the password for every safety conference.

#### Mine SAFETY PROGRESS in Wisconsin By A. H. Findeisen\*

HE metal mining industry in Wisconsin is composed of two groups, namely, the iron mining group located in northern Wisconsin on the west end of the Gogebic range and the zinc mining group located in the southwest section of the state. The iron mines involve large-scale, underground operations. The zinc mines are shallow, short-lived, employ small crews, and much of the equipment is primitive.

(Concluded on page 63)

<sup>\*</sup> Mining Engineer, Industrial Commission of



# Newest Mechanical Devices to Bring About Safety

By JOHN T. RYAN\*

A LTHOUGH a few mechanical devices to protect miners from injury were introduced into the mining industry in its early days, it has only been in the last 25 years that notable progress has been made in the use of modern, dependable mechanical safety equipment for mining. Much of this progress has taken place since 1930, or during the period of generally depressed conditions in industry. As it was during this same period that great stress was being placed upon reductions in operating costs, the introduction then of many new mechani-

cal safety devices in mines is striking proof of the contribution of such equipment to more efficient mining operation.

This contribution of safety equipment to efficient operation has come about through its effect in decreasing the direct and indirect cost of accidents, producing better working conditions, and adding to the quality of the final product. The recognition of these facts led many progressive mine operators to introduce new safety appliances into their mines during this period of depression.

Under present social and economic conditions it is difficult to reduce many operating expenses involved in mining.

The mineral industries have been faced for several years with rising costs of equipment, supplies, and labor, and the prospect is for additional increases in these operating costs as the price level and wage level rises. This increase in cost can be balanced in some branches of the industry by increased selling prices, but in other sections, notably coal mining, even minor price changes upward will result in a partial loss of the market due to the competitive fuels that are available.

The coal industry is not the only mineral industry so affected. Modern research in metallurgy has made many metals interchangeable in their use so that the prime factor determining their selection is their cost. A higher price for one metal as contrasted with a smaller rise for another will result in some loss of market for the former.

A specific instance of the recent development in mechanical safety devices is afforded by the electric cap lamp. This device has been improved by new developments so that it now has become an important tool for the miner in addition to its safety features. This change has come about through the increase in illumination afforded by the modern electric cap lamp from 35 candlepower to 70 candlepower. This has led to its introduction into non-gaseous coal mines and metal mines primarily on a basis of the benefits to be derived through efficient, dependable, and clear light at the working face. This greater illumination has increased worker efficiency, enabled separation of slate, gangue, and other impurities at the face, and in general brought to the miner many of the benefits realized long ago in factory work through adequate illumination. The dependable light from the electric cap lamp did away with any lamp adjustments on the part of the miner so that he could devote more of his working time to mining operations and not be required to spend 20 minutes to three-quarters of an hour in adjusting and refilling his open flame lamp.

Safety has been definitely aided by the widespread use of the electric cap lamp although in some instances safety was not the primary reason for its introduction. Reduction in mine fires, both in coal and metal mines, less accidents from roof falls due to the better light afforded for inspection, less minor accidents, and less accidents from blasting powder ignitions have resulted from use of the electric cap lamp.

Since 1933 there have been installed in the metal mines of North America approximately 35,000 electric cap lamps

<sup>\*</sup> Vice President and General Manager, Mine Safety Appliances Company.

which have successfully met a variety of operating conditions from Great Bear Lake in (near) the Arctic Circle to central Mexico. Over half of the 350,000 electric cap lamps in coal mines are now in mines classified as non-gaseous.

The general use of protective hats underground may have served to take them out of the class of new mechanical devices, but their widespread acceptance is a matter of rather recent date since the first practical protective hat was introduced in the late twenties and did not come into general use until the past few years. There is no doubt that the use of these hats has saved many lives and prevented much serious injury to miners in the few years since their general use. Falls of rock and other objects underground has always been a major hazard in mining and these two recent developments, better illumination through the electric cap lamp and adequate protection through use of the protective hat, have enabled mine operators to reduce their injuries from this cause.

Following the widespread use of protective hats has come the increased application of safety goggles and safety shoes to underground work. Ful-Vue goggles have served to eliminate former complaints as to reduction of vision when using a safety The difficulty in goggle. workers ordinarily having using glasses become users of safety goggles has been met by the preparation of prescription lens for safety goggles. Safety shoes are now available in many varieties to take care of workers in wet as well as dry places. Rubber boots and pacs are equipped with safety features to give the same protection as a leather safety shoe.

The satisfactory reduction in accidents to the head, foot, and eyes resulting from use of protective hats, goggles and shoes has led the insurance rating bureaus in some mining states to grant insurance credits for use of these articles of safety clothing. There is justification for these credits when it is considered that head, eye, and foot injuries in mines accounting for one-third of the bituminous coal production of Pennsylvania in the fiveyear period of 1926-1930, had a compensation cost of approximately \$1,500,000.

Until recently the theoretical line which separated a gaseous from a non-

gaseous coal mine was usually estab-lished at that point where methane could be determined by means of a flame safety lamp. For all practical purposes this was 1 percent of methane in air although in some instances observers with long experience could estimate concentrations of 2 of 1 percent. The limit for methane determinations has been greatly lowered by the methane detector so that percentages as low as 0.05 percent of methane can now be detected with accuracy and close estimations made to 0.01 percent of methane.

As a result of this greater accuracy in determining methane concentrations. the present system of dividing coal mines into two classes, gaseous and nongaseous, is undergoing some revision as it is now recognized that several classes can be established, each related to the extent of the hazard which depends largely upon the amount of methane genproved detector during the shift, as the one setting is sufficient. With this development the field of knowledge regarding methane concentrations in mines is widening, and it is estimated that 80 percent of the coal tonnage in the United States comes from mines in which over 0.05 percent methane can be found in the main return. Under these conditions it is very easy for an accumulation of methane to take

place should ventilation be retarded in any manner either in the entire mine or in any split. Constant check upon the methane being developed by a mine is necessary for safe operation. In one large coal mining state monthly reports from all coal mines as to methane content are required, and as a result not one miner was burned or killed by gas

ignition during 1936.

Another new device of importance in some mining operations is the hydrogen sulphide detector. This device is similar in operation to the carbon monoxide detector in that the air sample is drawn through a glass tube and a change in color that is proportional to the amount of hydrogen sulphide present takes place in the chemicals in the tube. Al-

though this gas is more dangerous than carbon monoxide, it has been somewhat neglected from standpoint of detection since its characteristic odor was thought

to give sufficient warning. However, it has been well established now that this gas deadens the sense of smell so that after a short exposure no disagreeable odor is noticed although the hydrogen sulphide may be present in even greater concentrations. This instrument is invaluable for investigating the nature of the air following blasting operations and mine fires, and in certain tunnelling operations where hydrogen sulphide may be encountered.

Reduction in haulage accidents has been approached through the use of heavier track equipment and heavier rolling stock as well as the use of all steel cars. Roller bearings are now to be found on many modern types of cars, as well as air brakes on the locomotives. Protection against accidents has been further aided through the recent development of a permissible trip light operated from a storage battery and of sufficiently rugged construction to enable it to withstand the rough treatment on haulage systems.

In addition to the accident hazard involved in mining there has been much attention given recently to occupational disease. This problem has been brought into prominence by the recent enactment of state occupational disease laws covering those cases of disability or death arising from the inhalation of dangerous dusts such as those of free silica. Wet drilling has been one mechanical method

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erated. Thus the various safeguards such as inspection regulations, mining machinery requirements, and ventilation standards can be definitely related to the amount of methane present. In addition to enabling rapid determination of methane content, eliminating guesswork and sizable errors, the portable methane detector has been recently improved so that its weight and dimensions have been reduced by more than half. It is not necessary to check the zero setting on the im-

# ACCIDENT PREVENTION and FIRST AID

# in Cyanidation and Flotation Plants'

By M. W. von BERNEWITZ\*

N a milling and cyanidation and/or flotation plant the principal hazards are dust, machinery, electric current, and poisoning. Dangerous places should have signs. The mine safety engineer should be able to cope with any accidents arising at a plant. A suitably equipped first-aid station or first-aid supplies is essential. At least five-and better still, all plant employes-should have received proper training in first aid, knowing how to dress wounds and how to treat anyone overcome by fumes of any kind. Accident prevention is an operating problem and costs show when something has happened-an injury or fatality that could have been prevented. In addition to the direct costs of accidents, the indirect costs have been proved by competent authorities to be four times those of direct costs. Indirect charges include possible damage to machinery, possible stoppage of operations, and loss of product and profit thereby, idle employes during stoppage, effect of accident on employes, and effect of accident on the victim's relatives.

#### DUST PREVENTION

Wherever practicable, dust should be prevented or minimized. A physical and X-ray examination before employment is enforced by some firms. More or less spraying of the lump ore and fans drawing off dust from hoods to cyclone arresters or baghouses is practised. With the possible growth of concentrate roasting, more dust will be made at that end of the flow-sheet, and provision should be made to reduce it (it cannot be entirely prevented), particularly at the discharge of a furnace, at the hot conveyors and elevators and where the calcine is pulped. Preventing or minimizing dust is as much an operating problem as preventing accidents. A dustless plant can be kept clean and painted; belts and bear-

ings do not wear so quickly; and the dust collected is as valuable, if not more so, than the ore, although sometimes it is more difficult to treat.

#### Poisoning

Cyanide is extremely poisonous, as a solution and as a gas, hydrogen cyanide, HCN. But its hazardous nature is well known by white and colored workers throughout the world, and serious cases or fatalities from cyanide are rare. Apparently, the most annoying result of handling cyanide salt and solutions is "cyanide rash." This breaks out more or less on a man's arms, face, and body. Some men are practically immune to it; others have to leave their occupation because of their sensitivity to it. It is a surface complaint, and internal remedies are of little use. Potassium permanganate or iron chloride give fair results in drying up the sore spots.

The swallowing of cyanide is accidental. We have known of men in testing solutions getting a mouthful from a pipet; another had solution splashed on his face and mouth from a tank and

also from a broken plug-cock. Prompt treatment must follow, whether the solution has been in the mouth or swallowed. Washing out the mouth with plenty of water is necessary. Either an emetic or stomach-pump or an antidote then must be given the patient. We quote Dr. R. R. Sayers, medical officer in charge of the Office of Industrial Hygiene and Sanitation, United States Public Health Service, Washington, D. C., in a personal letter:

"When taken internally by mouth, alkaline ferrous sulphate has been recommended for cyanide poisoning. Sollman recommends that this be made by adding ferrous sulphate to the official arsenic antidote, which is ferric hydrogen dioxide with magnesium oxide, and is made by adding 40 ml. of a solution of ferric sulphate diluted with 125 ml. of water. To this is added, when needed, 10 grams of magnesium oxide, which should be specially prepared; therefore, the two are generally kept separate, ready for mixing.

"Hydrogen peroxide has been recommended, but is effective only when the stomach is empty, and would probably not be recommended when a first-aid measure is necessary.

"During 1933, methylene blue was advocated for poisoning by hydrogen cyanide and was reported in an article by Dr. J. A. Trautman, of the Public Health Service, in *Public Health Reports* for December, 1933. He was unable to



Denver Sub-A, 24-in. flotation cells in Sunshine Silver Mill, Idaho

<sup>†</sup> Through the courtesy of J. V. N. Dorr, author of the new book, "Cyanidation and Concentration of Gold and Silver Ores" (McGraw-Hill Book Company, New York), the writer is permitted to present this section which was omitted from the chapter on "Plant Control." As the notes were written two years ago, a few changes and additions have been made.

\* Washington, D. C.

verify the results when using animals. Dr. K. K. Chen has shown in animals that while methylene blue gave some protection, and was probably somewhat useful, other treatments were of more value.

"Amyl nitrate was twice as effective, sodium nitrate and sodium thiosulphate each three and one-half times as effective, and a mixture of sodium nitrite and sodium thiosulphate seven times as effective as methylene blue. This was all animal experimentation and is reported in the Journal of the American Medical Association for June 17, 1933."

Other poisonous chemicals used about a plant in which gold and silver ores are treated are hydrochloric acid, for washing filter-cloth; sulphuric acid, in the clean-up rooms; caustic soda, quicklime, strong ammonia water, some flotation reagents, and occasionally chlorine, in refining gold; and bromine in making bromo-cyanide. Antidotes are alkali for acid and dilute acid for alkali. If the flesh is corroded, soothe it with oil. Treat for shock and give stimulants if the patient is conscious. Don't give an emetic when a corrosive poison has been swallowed.

Gases affect the human body in different forms: They may be

ferent forms: They may be skin irritants, eye lacrymators (causing tears), nose sternutators (causing sneezing), throat suffocants, or flesh vesicants (causing blisters).

#### RESUSCITATION

In actual experience with nine cases of poisoning, Dr. Sayers (cited) found that artificial respiration was satisfactory for emergency work. The methods described by the United States Bureau of Mines in its 221-page pocketsize Manual of First-Aid Instruction (1930), care adequately for all cases where hydrogen cyanide has been inhaled. More than a million of these books have been distributed free, and a revision is under way.

Briefly, the method used is the Schaefer or prone-pressure, and it is equally suitable for electric shock, drowning, suffocation, and gas asphyxiation. Artificial respiration should be begun immediately; every moment of delay is serious. It should be performed gently and slowly, 12 to 15 times a minute for the double movement of compression and release. Roughness may injure a patient, who must be kept warm. This operation should be continued without interruption until natural breathing is restored, if necessary four hours or longer. Two or more men can do this in short shifts, and should replace one another without breaking the rhythm.

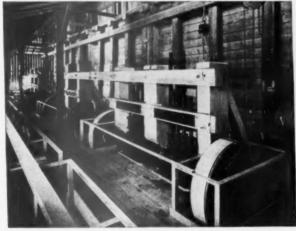
For electric shock, with a single quick motion free the victim from the current. Use any dry nonconductor (clothing, rope, board) to move either the victim or the wire. Don't take hold of the live

wire, and beware of using metal or any moist material. Send some one to shut off the current. If the victim is not breathing, remove from his mouth any foreign body. Then give artificial respiration.

For drowning, as soon as the victim is taken from the water, place him face downward, clasp your hands under his stomach, and lift him several times, letting his face hang down so as to drain his mouth and throat. Remove from his mouth any foreign body (tobacco, false teeth, or gum). Do not stop to loosen his clothing. Do not carry him any distance. Do not wait for a doctor. Treat him yourself.

For suffocation, the cause may be something blocking the windpipe and preventing air from getting into the lungs, or inhalation of harmful gases. Due care should be exercised by the rescuer to protect himself. Unless the air is good, get the victim to pure air immediately and start artificial respiration at once.

For gas asphyxiation, remove the victim from the poisonous atmosphere. If he is still breathing administer oxygen from a tank with a bag and mask for at least 20 minutes. If he is not breathing



Cam floor, Stamp Mill, Carson Hill Mine, Melones, Calif.

and his jaws are locked so as to interfere with effective artificial respiration, pry them open and wedge with a piece of wood, and remove any foreign body from his mouth. If an oxygen inhaler is at hand, as soon as the bag is fully inflated by opening the valve of the tank, adjust the face mask over the victim's nose and mouth, securing it by the head straps. Then give artificial respiration.

Continue the artificial respiration without interruption until natural breathing is restored, or for at least three hours. If natural breathing stops after being restored, use artificial respiration again.

Do not give any liquid by mouth until the victim is fully conscious again. Keep the victim flat. If after being partly resuscitated he must be moved, carry him on a stretcher. It is dangerous to make

an ill person, or one injured in any way, sit up or stand. To make him walk may cause his death.

#### PROTECTION AGAINST GAS

It may be necessary in a cyanide and/or flotation plant to enter some vat, tank, or closed vessel in which the air is asphyxiating and poisonous. Before entering, the place should be ventilated by blowing fresh air into it. The use of a hose-mask in tanks and other confined spaces is recommended. The Mine Safety Appliances Company one-man combination hose-mask with 50 ft. or more of 1-in. medium-weight oilproof hose, with safety belt, is the most popular and widely used and has been officially approved by the United States Bureau of Mines.

Two masks of the canister type, both officially approved, will take care of cyanide fumes:

1. The All-Service mask, in addition to cyanide in low concentrations, is suitable for all other industrial gases, including carbon monoxide, which might be encountered.

2. The Burrell GMK mask is for cyanide only. Both of these masks will take

care of concentrations up to 2 percent in air or where enough oxygen is present to support life. (Always remember that a gas mask does not supply oxygen, as does oxygen breathing apparatus; it merely filters out the fumes; therefore, no atmosphere deficient in oxygen should be entered with a gas mask.)

Skin absorption of cyanide becomes a critical factor in the protection of men from these fumes. It is impossible for a person to be overcome by cyanide fumes while wearing a gas mask which is giving 100 percent respiratory protection. This means that a person should not remain for any long period in a high concentration of cyanide fumes, say 2 percent in air, but should be

spelled off to guard against skin absorption.

#### BURNS

Many other accidents can and do happen in and around cyanide plants, but perhaps scalds and burns from sulphuric acid and caustic soda, also from roasting furnaces, may be as serious as any. In case of acid and caustic burns, the first measure is to drench the patient with water, and then remove any clothes necessary, but not any material that adheres to the skin-cut around that. If an eye is burned with chemicals, it should be well washed. For any type of burn, moistened picric acid gauze or hydro-picric ointment should be loosely applied to the place, and this and the other dressing kept moist. Care should be exercised not to bandage together fingers or toes, or ears to the side of the head. All sources of infection should be kept away because burned surfaces are like open wounds in this respect.

Tannic acid has been successfully used for the treatment of burns; spraying is one method of its application; another is jelly.

#### SAFEGUARDING EQUIPMENT

All milling and cyaniding equipment, which includes access thereto in the form of ladderways and stairways, must be guarded. . . . Handrails and treads should be maintained in good order. . . . Broken flooring should be mended, as a broken, bruised, or sprained ankle or leg costs money. . . . All gears should be protected by sheet-metal covers or by stout, course wire screening, placed so that they can be easily moved for repair or replacement. . . . Moving parts of heavy machinery should be lubricated by grease under pressure, the control being at a safe place. . . Mills should be within an enclosure or railing. . . . All tanks should have handrails around . . . Adequate lighting should be them. provided at all places where men work or have to go. Dark places are avoided and machinery there becomes neglected. ... Danger signs should be posted where necessary, not promiscuously, inside and outside any works. . . . Adequate fire protection should be provided in the shape of water under pressure with hydrants and hose, also buckets and barrels of water in accessible and suitable places. Don't build a mill at the mouth of a shaft or tunnel, because fire in one or the other will set either alight and endanger every worker. Also, clear all growth, as trees and brush, to a safe distance from all flammable structures.

#### PROTECTIVE CLOTHING

Some consideration may be given to some of the protective clothing used in mines. Of course, what is known as the hard hat may be out of place in a plant, although if a man has to go into bins where ore is likely to fall on him, such head protection is worth wearing. Goggles have saved many an eye from injury by pieces of rock or steel, and they should be worn around crushers and in machine shops. If a man has to go into bins where fine ore might slide over him, a safety belt is a safeguard. Hard-toed boots are comfortable and prevent the feet from being crushed. Gloves or mittens are good protection and warm for the hands whether the job be one of ore-sorting or handling machinery and tools during operation or repair work, or even for frostbite if outside work has to be done. All of these items of protective clothing are procurable at reasonable prices from or through a mining company.

#### ACCIDENT RATE IN MILLS

The Employment Statistical Section of the United States Bureau of Mines, through W. W. Adams, chief statistician,



Machine Shop at Sunshine Silver Mine, Idaho

reports that in a recent year at 18 cyanidation and/or flotation plants, working 1,360,633 man-hours, there were 51 lost-time injuries (2 fatal), with an accident rate of 37.48 per million hours of exposure. One of the fatalities was by fall of person, the other by suffocation in an orebin. The causes of the temporary injuries were falls of persons, 15; other machinery, 8; falling objects, 7; hand tools, 6; handling materials, 4; crushers, rolls, or stamps, 2; flying pieces of rock, from sledging or crushing, 2; electricity, 1; and other causes, 4.

An analysis of lost time through accidents at the Howey gold mine, Ontario, according to J. L. Ramsell, chief engineer, in Canadian Mining Journal for October,

1934, shows that during 1933 there were 6 accidents involving 44 days. In the crushing plant and mill, one accident was due to machinery and two accidents to general work, and on the surface three accidents were in general work. These figures show a considerable reduction when compared with those of 1932 and 1931. It is found that there are more accidents in winter than in summer. The mill treats 1,000 tons a day. A safety committee, with representatives from every department and the chief engineer as chairman, makes a thorough examination of the whole property each month. Suggestions from the committee or any employe are freely discussed and acted upon if suitable.

#### "California Journal of Mines and Geology"

The Division of Mines, Department of Natural Resources, under the direction of Walter W. Bradley, State Mineralogist, announces that the October, 1936, issue of "California Journal of Mines and Geology," comprising Chapter 4 of State Mineralogist's Report XXXII, is now ready for distribution.

The October quarterly has a detailed economic and geologic report on the Mines and Mineral Resources of Lassen and Modoc Counties, including a geologic map of the Diamond Mountain district, Lassen County, by Chas. V. Averill, District Mining Engineer, and H. D. Erwin, Mining Geologist. Mr. Erwin was employed by the Lassen County Board of Supervisors. The Geologic Branch presents a paper on the "Mechanics of the Lone Mountain Landslides, San Francisco, Calif.," by Wm. M. Cogen.

This number also includes the Biennial Report of the State Mineralogist to the Governor; a Special Article on "Properties and Industrial Applications of Opaline Silica," by John T. Thorndyke and the usual notes concerning Oil Field Development Operations, Statistics, Museum, Laboratory and Library. The com-

plete index to Report XXXII for the year 1936 is published in this final chapter.

The price of the October quarterly is 40 cents plus 10 cents shipping charges, if mailed. There is also 1 cent tax on sales to California residents.

It may be obtained from the offices of the Division of Mines, San Francisco, Sacramento, Los Angeles, and Redding; and from the offices of the Division of Oil and Gas in Bakersfield, Taft and Santa Barbara.

#### T. T. Toole With Barber Co.

T. T. Toole, former director of marketing for the Philadelphia & Reading Coal & Iron Co., is now associated with the Barber Co., Inc., of 1600 Arch St., Philadelphia, as sales manager. The latter company, through its subsidiaries, is the world's largest producer of asphalt, its Trinidad asphalt being extensively utilized in road construction. The Barber companies are also among the largest manufacturers of roofing materials and large producers of petroleum products.—(Anthracite Institute)

# Of All Things ...

The best brains of the Administration have been applied to figuring out a crop that will survive the vicissitudes of the Dust Bowl. . . . Almost any simple farmer could SUG-GEST the dandelion. . . .

#### MONOMOM

An oceanographic expedition has found a hole in the Atlantic nine miles deep. . . . That's only half as deep as the depression most of us poor fish swum around in not so long

#### monono

Nobody sees anything to get excited about when a Congressman from a coal state proposes a tax on fuel oil.... What is bothering us is why Congressmen from coal states are so all fired anxious about a tax on coal....

#### LORDONOR

What's troubling most Senators these days is that the constituents who some months ago reposed confidence in them are no longer willing to let it repose . . . they want action. . . .

#### mound

The March income tax returns fell about \$100 million short of expectations. . . . The trouble with the official computers is that they always inflate the expected income and deflate the expected outgo. . . . A year later they learn they should have done the reverse and they would have arrived at the correct deficit. . . .

#### MINIMA

If all the lawyers who think they stand a chance to go on the Supreme Court bench were laid end to end—there would be wood enough to make the bench. . . .

#### winding

Justice McReynolds believes there is no better place to expound plain English than at a Greek letter society dinner. . . .

#### MINIMA

Well, now that Senators have gotten around to endorsing cigarettes, we're waiting for their wives to come out for their favorite toilet soaps. . . . And a rumor runs the rounds that California and Florida members are going to wear signs while in session extolling the climates of their respective states. . . .

#### MINIMA

Every man will work overtime when there is an emergency. . . . Chief Justice Hughes' usual bedtime is 9 p. m. . . . But he was up to midnight writing the letter which silenced for all time the thought that the Supreme Court couldn't keep up with its work. ... Considering that he only spent three

hours on it, it's probably lucky for the Administration he didn't have two days to prepare the letter. . . .

#### MONONON

When the sit-down strike spreads to the farms we'll bet they won't sit down long. . . . The points of a pitchfork sometimes work wonders. . . .

#### MINIMA

Some people think the judiciary loses its swing at seventy. . . . And this month the Blue Danube waltz became seventy years old. . . .

#### MOMONIA

Maybe the sit-downers will learn pretty soon that public opinion has become a sharp tack right where they're sitting. . . .

#### MIMMONIA

A headline tells us that "Millionaires Failed to Multiply in 1936." . . . No wonder. . . . Good old Uncle Sam kept them dividing . . . with him. . . .

#### MANAGER

Congress passed the first corporation tax on August 5, 1909. . . . And hasn't missed a single year since. . . .

#### MINONON

Democratic commentators have suggested that, taking into consideration the distance between Republicans, John M. Hamilton's \$10,000 travel allowance won't last very long. . . .

#### MIMIM

And how much do you think dear old John Public is going to be nicked for the printing bill for the Congress this year.

... Just a niggardly \$3,800,000.... Which is a \$50,000 reduction from last year's bill.... The big question now is how to hold down on some of the members so that the printing bill can be kept within the limits set....

#### MOUNT

Most of us are getting to the point where

point where the only "strike" we'd like to hear about is the one the umpire calls....

#### ) #D #D #D #D

If you want to know just how much of a work factory Congress really is, just stop and think that \$61,160 is appropriated for the coming fiscal year for merely folding speeches to be sent out to constituents.



# Wheels of Government

As Viewed by A. W. Dickinson of the American Mining Congress

THE fourth month of the seventy-fifth session of the Congress opens with the record showing that less legislation has been enacted than by any Congress for years past. It is true that the Departmental Supply Bills are moving ponderously on their way and certain other measures such as the neutrality bills have been passed but most of these are still in conference.

It is, of course, well understood that the battle raging over the "packing" of the Supreme Court is the cause of de-The legislative program of the Administration awaits primarily two things: First, the disposal of the Supreme Court issue, and second, the decision of the Supreme Court in the National Labor Relations Act cases. Many commentators read into the Supreme Court decisions of Monday, March 29, the probable outcome of the pending decisions on the Labor Act. In the Virginian Railway Labor Act case, the court construed the law (the Railway Labor Act) to mean that the employers must treat with the authorized representatives of a majority of their employees, except that individual contracts may be made directly with individual employees. The decision moved a little closer to intrastate production, inasmuch as it brought the so-called "back-shop" workmen under the enforced collective bargaining provisions. In railroad practice such shops are engaged in the complete dissembling and rebuilding of locomotives as well as in the manufacture of new parts and devices of many kinds-for service, it is true, in connection with railroad operation. In the case of the Washington State minimum wage law for women, the court reversed an earlier decision on a similar New York law and it is thought by many that this removes not only the bar to state legislation on minimum hours for women but also on minimum hours for men. Seventeen of our states now have such laws for women.

The Guffey-Vinson Coal Bill has moved rapidly this year and after passing the House it would have encountered little real difficulty in the Senate but for a peculiar circumstance. Senator Byrns of South Carolina offered an amendment to outlaw the sit-down strike and precipitated several days of debate before the bill was passed.

Earlier in the year coal producers of the nation had exhausted every effort to reach agreement on a bill which would probably have been substituted for the one just passed. After these efforts, opposing coal producers would not register any determined resistance to the Guffey-Vinson Bill. A minority group developed a bill introduced by Representative Casey, of Massachusetts, but the measure was given scant attention and will now undoubtedly lie dormant, unless it is revived because of litigation which may engulf the Guffey-Vinson Act.

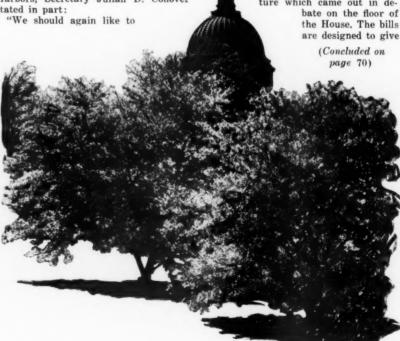
There has been activity on the Vinson Stream Pollution Bill reintroduced in this session as a companion to the Barkley Bill in the Senate. The Committee on Rivers and Harbors of the House has ordered the Vinson Bill reported to the House calendar and passage is anticipated in the near future. The measure provides for study and planning by a board of five engineers under the Surgeon General of the United States Public Health Service. Provision is made for cooperation with state agencies and "authorized representatives of interested industries" and the bill is in no sense a mandatory measure. In presenting the position of the American Mining Congress to the Committee on Rivers and Harbors, Secretary Julian D. Conover stated in part:

emphasize that pollution problems are essentially local and vary greatly in nature and degree in different areas. We are therefore not in favor of uniform state laws or of Federal action to encourage adoption of such laws.

"With respect to Federal assistance for the treatment of sewage and industrial wastes, we express the hope that your committee, in its consideration of this bill, will provide suitable safeguards against undue or excessive expenditure of public funds which might jeopardize the fiscal position of the National Government."

It is anticipated that Senator Lonergan, of Connecticut, whose mandatory Stream Pollution Regulation Bill has been reintroduced this year and is now in the Committee on Commerce, will make a strong effort for the enactment of his bill as against the Barkley-Vinson measure.

In connection with the passage of the two "Neutrality" resolutions, now subject to a controversial situation in Conference Committee, there was on March 16 an interesting feature which came out in debate on the floor of the House. The bills are designed to give (Concluded on



#### Mine Safety Progress In Wisconsin

(Continued from page 55)

Accident frequency rates have been steadily reduced over a period of years to an extent comparable in some instances to those obtained in many other kinds of industrial activities. Enviable records have been established, and operations for a period of a year without a single lost-time accident have been attained in several instances. These low-frequency rates reflect the extent to which accident-prevention work has been adopted and applied.

The safety methods employed by the companies cannot be said to be outstanding or original. Recognized methods and practices have been adopted and revised to fit local conditions.

The basic principles having a bearing on the attitude of the employer in recognizing the need and value of accidentprevention work are:

(1) The managements were convinced that most accidents are preventable, and determined to institute a thorough-going program to keep the accident rate as low as possible.

(2) That safety was considered a major operating problem. The executive officers were, therefore, charged with the responsibility of setting up an effective program.

(3) The economic value of accidentprevention work in lowered compensation costs.

(4) Recognition of the four major elements connected with a successful accident - prevention program, namely, attitude, organization, education, and discipline.

Following are some of the important features of the methods used by operators of the large mines in the application of their safety programs. Full-time safety departments directly answerable to the manager are maintained. Responsibility of the supervisory staff includes accident prevention as a part of their duties. Accident hazards are considered when planning installations of new equipment and changing systems of mine operations. Supervisory members participate in the formulation of safety rules, which are issued in printed form to all of the workers. Newly employed workers are required to become familiar with the safety rules and conduct themselves accordingly. Safety wearing apparel such as safety belts, hard hats, hard-toe shoes, goggles, etc., have been adopted as standard equipment, and their use is compulsory.

To insure good health supervision, adequate medical services, physical examinations, and 100 percent first-aid training are provided for. Other features include safety committees, good housekeeping, education and discipline of the worker. safety activities are not allowed to become dormant or spasmodic, and whole-hearted cooperation is accorded to the Industrial Commission and the U. S. Bureau of Mines.

Small zinc mine operations are not in a position to maintain paid safety departments, and the supervisory staff, therefore, include safety activities as a part of their duties. They have rallied and cooperated harmoniously with the state inspection department in all matters connected with the state safety regulations. This is indicated by the fact that mechanical hazards on new installations have been found guarded in a standard manner by the inspector in nearly all cases after an extended absence from the field.

Rigid inspections are made daily for dangerous conditions to prevent accidents from fall of ground. Other features include effective guarding of all mechanical hazards, first-aid training, maintenance of bulletin boards, and prompt medical treatment to prevent infections. Safety wearing apparel has been adopted as standard equipment. A high type of intelligent labor is available in the district for employment, which greatly helps in the application of a safety program.

#### Dollars and Cents Value of Safety

(Continued from page 45)

It has been demonstrated that mines can be operated over long periods of time with few, if any, accidents, and instances of this are no longer rare. Accordingly, it may be assumed that practically all accidents are preventable. The question then may be asked—does it cost less to remove the cause of an accident or stand the expense of compensation, the attendant confusion and the losses to production arising directly and indirectly from it?

One small piece of coal, sharp as a splinter of glass, flying from the working face, may destroy the sight of a miner's eye. Compensation payments would buy enough protective goggles to safeguard the eyes of every man in the mine for years, and what miner would

trade his sight for all of the money in the compensation fund? The same may be said of safety hats and head injuries, and of other protective clothing and devices. One head injury years ago has cost an amount sufficient to pay for safety hats for every miner in Utah. Many concrete stoppings and overcasts can be built for the expense of a gas explosion. Electric cap lamps are far less costly than mine fires, and the damage from a coal-dust explosion would exceed the cost of rock dust and sprinkling for the combined mines of an entire coal district for a generation.

It is not alone the value of safety in dollars and cents that is of great concern, but that the price of working dangerously is more than any mine can afford to pay.

#### A Well-Merited Recognition

Appointment of Allen J. Johnson, Director of the Anthracite Industries Laboratory at Primos, Pa., as a member during the current year, of the Committee on Correlation of Research of the American Institute of Mining & Metallurgical Engineers has just been announced by that organization. Here is further recognition of the efforts of the Laboratory, which has become headquarters for information dealing with anthracite. He was also reappointed to serve on the committee on "Use of Coal" of the same organization, on which committee he has served for several year. -(Anthracite Institute)

The scale committee of the Pocahontas Operators Association is composed of Henry Warden, American Coal Company; M. L. Garvey, New River Company; P. P. Kerr, New River & Pocahontas Consolidated Coal Company; R. E. Salvati, Island Creek Coal Company; and H. C. Faust, United Pocahontas Coal Company.



# Serving the COAL INDUSTRY

STABLISHING a new all-time record for enthusiasm and originality, the plans for the fourteenth Annual Coal Mining Convention and Exposition of the American Mining Congress to be held at Music Hall, Cincinnati, Ohio, May 17-21, are rapidly nearing completion. The program promises to be one of the finest ever presented and the exposition will be larger and more important than any of its predecessors.

portant than any of its predecessors.

C. E. Cowan, vice president of J. H. Weaver and Company, has been directing the activities of the program committee as chairman. He has been assisted by 94 coal men, representing every coal producing state and district in the country. The development of a program to meet all needs and interests is something of a task. Suggestions were received this year from literally thousands of coal operators and when the program committee met for its final meeting, it was faced with the task of selecting a maximum of 48 papers, from the 189 suggested topics which were a consolidation of hundreds of papers proposed.

The tentative program released to the industry early in April includes such important topics as: Stream Lining Mine Ventilation; Material Handling and Conservation of Mine Supplies Underground; Cutting Requirements for Conveyor Mining; Barrier Pillars to be Left in the Mine; Mining Under Flood Con-

ditions in the Anthracite Field; Advantages of Sectionalizing Power by Use of Automatic Circuit Breakers; Communication Systems in Mines; Use of Battery Locomotives in Thick Pitching Seams; Waxolized Treatment of Coal; Effect of Mechanical Versus Hand Loading on Degradation of Coal; Face Preparation for Mechanical Loading; Advanced Mine-Rescue Training Courses; Mining Systems for Extracting Pillars; Mercury Arc Rectifiers for Coal Mining Service; Shearing as an Aid to Mechanical Loading; Results from Operation of Mine Power Plant; Mechanical Loading on Conveyors; Bringing Safety Home to the Miner; Developments in Truck Haulage in Strip Mines; Transportation by Underground Conveyors and Aerial Trams; Modern Mine Drainage; Mining Extension Courses of Various Universities; New Developments in Methods with Mechanical Loaders; Definition of Terms—Power Factor, Load Factor, Load Demand; Safety Bonuses; a Coal Cleaning Symposium, which will present Dewatering Screens and Heat Driers, Coal Washing Tables, Modern Screening and Dedusting Practice, Methods of Cleaning Strip Coal, and Preparation of Coal in the Anthracite and in the Alabama Fields; the Future of Mechanical Mining; Merchandizing Anthracite; Securing Teamwork Between Management and Labor; and last,



National Chairman C. E. Cowan Vice Pres., J. H. Weaver & Co.

but by no means least, a comprehensive discussion on Bituminous Coal Research.

There are a number of additional papers that the committee is arranging; they will present a maximum of six papers at each session, and these sessions this year will again be under the direction of a Floor Committee which will be reponsible for timing and expeditious handling of the entire program.

W. W. Dartnell, well known coal mine operator, formerly of the Valley Camp Coal Company, is chairman of the Committee on Arrangements. The duty of this committee is to see that all events are handled with the greatest efficiency. The work of this committee begins with

the welcoming of delegates when they register and is ended only when the final curtain comes down on Friday noon, May 21. This committee is arranging many innovations that give rise to the feeling that the convention and exposition will surpass the splendid achievement of 1936, when this convention established a new record in attendance, in its exposition, in its entertainment features and in its general value to the industry.

One of the most important factors of the convention is the entertainment section. W. D. Turnbull, Westinghouse Electric and Manufacturing Company, who has, for a number of years, served as chairman of the entertainment section has a number of new ideas to present this year which offer a marvelous array of talent and at the same time provide means whereby delegates themselves may participate in the events. The National Amateur Hour of 1936 was such a tremendous success that from all over the industry requests came in to repeat it at this year's meeting. Therefore, Mr. Turnbull and his committee have arranged to present the Miners National Amateur Hour on Monday, May 17, in the Pavillon Caprice at the Netherland Plaza Hotel. A number of companies are participating and elimination contests are being held throughout the coal mining fields. An effort will be made to present a 15-minute broadcast over a national chain for the winners. An unusual entertainment will be Tuesday night at the "Gay Nineties." Delegates will hear such old favorites as Joe Howard, old-time song writer and distinguished musician, who wrote such lasting hits as "I Wonder Who's Kissing Her Now." They will also see the Floradora Girls and many other delightful events. On Wednesday night, the committee is arranging for the Lucky Shoes Contest. This is a sparkling and unusual form of entertainment. Delegates will have an opportunity to select "Cinderella's Slippers." On Thursday night, the annual speechless dinner already promises to be of more than average importance. The guest star of this evening will be Miss Ruth Etting, favorite of stage and radio; featured throughout the entertainment each night will be the California Varsity Eight, a singing organization of young men who have made musical history, both on the New York and Chicago stage; also the Byton Petite Review, a group of charming girls in specialties and ensemble dancing. The Kelly-Bahlke dancers will also participate, as they did last year, and Ward Wilson, distinguished imitator, famous radio and stage comedian, will serve as master of ceremonies throughout the convention's entertainment features.

John C. Cosgrove, president of the West Virginia Coal and Coke Company, and John Coakley, of Thomas A. Edison, Inc., serving as co-chairmen of the Attendance Committee, are making the industry fully conscious of the importance of this year's convention and are predicting that the attendance will top the

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5,000 mark. W. W. Rodgers of the Westinghouse Electric & Manufacturing Company, working closely with the Attendance Committee as chairman of the Publicity Committee, is doing excellent work in presenting full information to the press. A. W. Fisher, McGraw-Hill Publishing Company, is arranging for an entirely new idea in the matter of contests where delegates will have an opportunity to determine the prize winning exhibits and also to win prizes themselves.

Every indication is that the industry will turn out in full justification of the efforts of their fellow operators in providing them with such a splendid program, educational exhibits and unusual entertainment.

The exposition, which is a big feature

of this important meeting, has already overflowed the facilities of Music Hall. It will be necessary to construct a temporary building on the sidewalk in front of the hall, and immediately adjoining the main entrance. Therefore, the exposition will, this year, occupy four major halls and approximately 75, 000 square feet of floor space. Magnificent exhibits are being prepared by the Jeffrey Mfg. Company, of Columbus, Ohio, who is celebrating its sixtieth anniversary; the Sullivan Machinery Company, of Chicago, who announces that it will present many new and entirely different types of equipment; the Goodman Mfg. Company presenting its complete line of equipment; the Joy Mfg. Company showing all types of loaders offered to the coal mining industry. While these companies comprise some of the larger machinery houses, all other exhibitors, large and small, will present new ideas, new equipment and a new message. Exhibits will be presented more attractively this year than ever before. Special backgrounds are being built and there will be much color and life to the exhibit as a whole.

Bruce G. Shotton, Hendrick Mfg. Company, is the national chairman of the Manufacturers Division, a group of 50 manufacturers selling their products to the coal mining industry. This group has sponsored this convention and exposition for the past 14 years. L. W. Shugg, of the General Electric Company, who has served as Director of Exhibits since 1928, will again serve in his usual

capacity.

Howard I. Young, President of the American Mining Congress, has addressed a letter to the entire coal mining industry with a special invitation that they shall attend this convention. Cooperating with Mr. Young on the national board of the American Mining Congress, in the development of this meeting are the coal directors which include: J. D. Francis, president, Island Creek Coal Co.; W. J. Jenkins, president of the Consolidated Coal Company and president of the Illinois Coal Operators Association; A. B. Jessup, vice president, Jeddo-Highland Coal Co., representing the anthracite industry, and Eugene McAuliffe, president of the Union Pacific Coal Company. A. E. Bendelari, president of the Eagle Picher Lead Company, while being a representative of the metal mining group, as a director of the American Mining Congress and local representative of that organization at Cincinnati, will again take an active part in the affairs of the convention.

With the growth of mechanical mining as evidenced by reports earlier in the year, more than ordinary interest attaches itself to both the convention and exposition. New things are being done throughout the industry and operators generally are anxious to know about them. The Operators Committees of the American Mining Congress, a group of coal men who have been studying these developments, have been of inestimable value to Mr. Cowan and his

Program Committee in the development of this year's meeting. The programs for these meetings are largely a culmination of the activities of this important group which has been such a factor in the success of the Cincinnati convention.

Every coal operator interested in keeping abreast with coal problems should be at Cincinnati and every coal executive who wishes to increase the efficiency of his property, should see to it that each of his key men spend two or three days at this convention and exposition.

The following companies will present exhibits:

Advertising Displays, Inc.
Ahlberg Bearing Company.
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American Steel & Wire Co.
Anaconda Wire & Cable Co.
Atlas Powder Co.
Austin Western Road Machinery Co.

Bethlehem Steel Co. Bowdil Company. Broderick & Bascom Rope Co. Brown-Fayro Company. Bucyrus Erie Co.

Card Iron Works Co., C. S. Carnegie-Illinois Steel Corp. Chicago Pneumatic Tool Co. Cincinnati Mine Machinery Co. Coal Mine Equipment Sales Co. Coal Mining. COMMITTEE ON ARRANGEMENTS Chairman, W. W. Dartnell, Morgantown, W. Va.

WELCOME TO DELEGATES—Newell G. Alford, Consulting Mining Engineer; W. H. Cordes, American Steel & Wire Company.

ATTENDANCE—John C. Cosgrove, West Virginia Coal and Coke Company; John Coakley, Thomas A. Edison, Inc.; John T. Sydnor, W. A. Buchanan, B. E. Schonthal, Don A. Weber, Harry LaViers, L. J. Lorms, E. B. Gellatly, C. W. Gibbs, J. A. Malady, C. S. Blair, L. Russell Kelce, and I. N. Bayless.

FLOOR—H. B. Husband, C. & O. Railway Company; M. D. Cooper, F. F. Jorgensen, Sydney A. Hale, and Geo. R. Delamater.

PUBLICITY-W. W. Rodgers, Westinghouse Elec. and Mfg. Co.

CONTESTS-A. W. Fisher, McGraw-Hill Publishing Company.

ENTERTAINMENT—W. D. Turnbull, Westinghouse Elec. & Mfg. Co.; L. Russell Kelce, J. R. Ulrich, H. J. Saladin, S. W. Blakslee, A. R. Joyce, C. J. Sandoe, Chas. W. Connor, Harry M. Moses, R. T. Middleton, H. H. Taylor, Jr., J. H. Fulford, C. R. Moffatt, J. A. Malady, and L. F. Crouse.

Coal Process Company.
Coffing Hoist Company.
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Hazard Wire Rope Division of American Chain & Cable Co.
Hendrick Manufacturing Company.
Hercules Powder Company.

Irwin Foundry & Mine Car Co. I-T-E Circuit Breaker Co.

Jeffrey Manufacturing Co. Johns-Manville, Inc. Joy Manufacturing Co. Joyce-Cridland Company.

Keystone Lubricating Co. Koppers Company.

La-Del Conveyor & Mfg. Co. Lehigh Safety Shoe Co. Leschen & Sons Rope Co., A. Link-Belt Co.

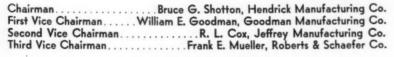
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Manufacturers Division

**OFFICERS** 

1936-1937



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A view of the 1936 Coal Exposition of the American Mining Congress. The 1937 edition will present an even more magnificent display.

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United Engineers & Constructors, Inc. U. S. Steel Corp. Universal Atlas Cement Co. Universal Lubricating Co. Utility Mine Equipment Co.

Viking Manufacturing Co.

Watt Car & Wheel Co.
Weir Kilby Corporation.
West Virginia Rail Co.
Western Cartridge Company.
Westinghouse Electric & Mfg. Co.
Williamsport Wire Rope Co.

#### Bureau of Mines Motion Picture Films Shown to Audience of 7,000,000 in 1936

A total of 7,252,000 Americans learned something of how minerals are produced and utilized through attendance at the showing of the educational motion-picture films of the U. S. Bureau of Mines, during the year 1936. The films, covering 57 different subjects, were exhibited on 84,783 occasions, the attendance figures exceeding those of any previous year. Approximately 500 reels were added to the Bureau of Mines motion-picture library during the year, making over 3,000 reels available for distribution. The cost of producing the films is

borne by cooperating industrial concerns. The films are used by educational institutions and engineering societies throughout the country. Some of the films have actually been made a part of prescribed courses in certain colleges.

The films depict mining and related manufacturing processes; they show where minerals are found and how they are extracted from the earth, manufactured or refined into useful every-day products, utilized, and conserved. The prevention of accidents and the protection of human life have been given special attention, and several pictures deal specifically with this important

The interesting stories of the production and use of the important industrial metals, such as copper, iron, silver, lead, and nickel, are shown. The important nonmetallic minerals, such as sulphur, asbestos, cement, fireclay, and abrasive materials, form the subjects of other films. The use of explosives in mining operations is visualized.

All motion-picture subjects are "silent" and, except for a few, are available in both 16- and 35-mm. widths. The films are loaned to educational institutions, engineering and scientific societies, civic and business associations, colleges, churches, and other responsible organizations.

# Mechanization Trends

# Reports of Coal Operators Committees

### Mechanical Loading Time Study

THE following report submits a time study that was made for an entire mine using two loading machines with two face crews. The face crew from which the charts have been prepared was considered the average for the mine, consisting of two loader men, two pan men, two machine men, and one shot-fire man. The summary on chart 7 shows the general time other than the face crew that was charged proportional to the one loading unit from which these charts were prepared.

There were eight places loaded out by one face crew yielding better than 200 tons, but, as will be noticed by chart 2, there were only 150 tons cut by the cutting machine. The other 50 tons loaded were cut previous to the beginning of the shift under consideration.

So far as the bug dusting and the scrapping is concerned, which is shown on chart 1, it is about as good as can be expected under these conditions, and we think that there is not much improvement to be made.

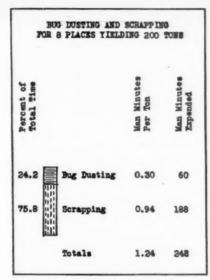
Chart 2 shows the time expended by the cutting machine in cutting coal. The most outstanding feature of this graph is that better than 23 percent of the total time used on this shift was spent in tramming or moving the machine from place to place. When this percentage is compared with the percentage shown by char: 5, which shows the performance of the loader, it is to be noticed that only 3.73 percent of the total time of the load ar was used for the purpose of trammin; or moving, while the cutting machine used 23.29 percent. This is due to the fact that the loading machine is mobile, being on caterpillars, and that the cutting machine was moved by the feed rope. This loss of time could be eliminated if there was a cutting machine for each working place, or by having the cutting machine mounted on caterpillars.

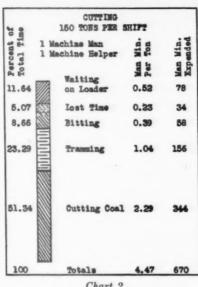
Chart 3 shows the performance and the time employed in the drilling and the shooting of 200 tons. The lost time amounts to 13.5 percent, due to the filing or sharpening of the drill. Outside of the lost time, there could not be much improvement made on this item.

Chart 4 shows the time consumed by the pan men in extending conveyors and incidental work. The lost time shown is 24.64 percent of the total time spent, caused by the work on the conveyor and waiting on the loader to get out of the way. The item that is highest and can be improved materially is the item of transporting sections. This item amounts to 32.74 percent of the total time, or 1.01 man minutes per ton of the coal produced. This time can be reduced at least 60 percent by the use of a small room hoist for the handling and moving of

|                          | CONSOLIDATED SUMM                       |                     |                      |
|--------------------------|---|---------------------|----------------------|
| Percent of<br>Total Time | OR 200 TONS BI I FAC                    | Men Min.<br>Per Ton | Man Win.<br>Expended |
| 4.89                     | Dusting & Scrapping                     | 1:24                | 248                  |
| 13.21                    | Cutting 150 T.                          | 4.667               | 670                  |
| 6.13                     | Drill & Shoot                           | 1.555               | 311                  |
| 12.18                    | Conveyor                                | 3.085               | 617                  |
| 20.10                    | Loading Coal                            | 5.095               | 1019                 |
| 43.49                    | General Time<br>Other Than<br>Face Crew | 11.025              | 2205                 |
| 100                      | Totals                                  | 25.667              | 5070                 |

Chart 7





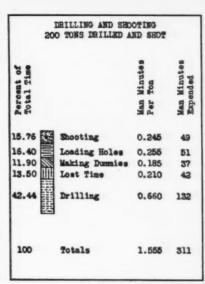


Chart 1 Chart 2 Chart 3

the conveyor sections. The actual time extending conveyors amounted to 24.15 percent. This can be reduced. With one type of chain used, it required 34 man minutes to extend the section, and another type of chain required 60 man minutes to extend the section. This, of course, can be improved.

Chart 5 shows the items entering into the operation of the loader. It will be noticed 56.43 percent of the time was used in loading coal, or 2.875 man minutes per ton. Oiling and repair work amounts to more than 29 percent of the total time involved. The other items are about as good as could be expected, with the exception of the man minutes per ton loading coal. This can be reduced.

Chart 6 shows the proportional part of the time employed in and about the mine that would be chargeable to one face crew.

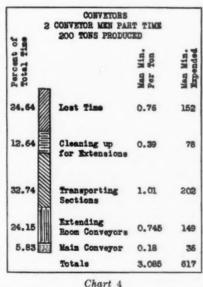
Chart 7 shows the consolidated time chargeable to the one face crew for the production of 200 tons. This chart shows that there was 5,070 man minutes of labor expended on the shift for the production of 200 tons.

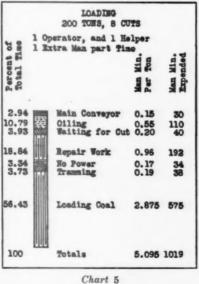
To arrive at the cost of any one of the items entering into the production, we will take as an example the loaders, operating under our present wage scale. The operator is paid 68 cents per hour and the helper 62.3 cents per hour. Adding the 68 cents per hour to the 62.3 cents per hour gives \$1.303 for 120 man

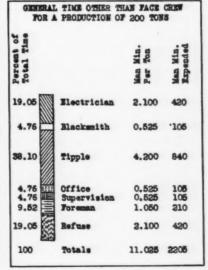
minutes. Dividing the \$1.303 by 120 man minutes equals \$0.0109 per man minute. Multiplying this cost per man minute by the number of man minutes, which in this case we will say five man minutes, brings the labor cost, so far as the loader is concerned, to \$0.0545 per ton. Each item can be worked out accordingly by applying the prevailing wage scale.

The figures on the following charts are taken from actual operating conditions, and there are no assumptions made in the time that is shown on these charts.

-Submitted by O. S. Batten, Committee of Eastern Kentucky.







4 Ci

Chart 6

#### **Newest Mechanical Devices and Safety**

(Continued from page 57)

used for reduction of dust from drilling operations, but underground mining has certain operations in which the reduction of dust is difficult or impossible to accomplish. In several instances the only practical protection is that afforded by personal protective devices.

These personal protective devices or respirators have been greatly improved in the past several years and several types of respirators bearing the approval of the United States Bureau of Mines are in general use in the mining industry. These approved dust respirators have passed rigid specifications and tests to insure that the respirator gives an adequate degree of protection, wearing comfort, and convenience in use. Adequate protection against dusts of the very fine particle size found in mines low breathing resistance are the chief features of the new approved respirators, and the older types are being replaced by approved respirators.

In some mining operations, air-supplied respirators are being used successfully especially where high dust concentrations and extremely wet mining operations are combined. To supply clean and safe air to these air-supplied respirators, the Mine Safety Appliances Company developed this past year the application of a small compressor unit operating on a unique principle by which the air is filtered, thoroughly cleaned, and humidified. Use of these small compressor units to supply several air-line respirators eliminates any danger of contamination of the air due to rusty air lines, objectionable odors from compressor operation, and the danger of carbon monoxide in case of faulty compressor

operation. These contaminants are not of particular importance when air is used for drilling operations, but become matters of great concern when the air is breathed by workmen wearing air-supplied respirators,

#### Wheels of Government

(Continued from page 62)

the President of the United States power to regulate the export shipment of arms, ammunition and materials to foreign countries in the event of war. We quote the following from the Congressional Record of that date:

Mr. FISH. The President does not have the power to lay embargoes on commodities, because that is a constitutional power lodged in Congress.

Mr. SHANLEY. He has the power in the case of war ammunitions by international law.

Mr. FISH. That is right.

Mr. SHANLEY. But there is a difference between "munitions" and "ammunition." Let us straighten that out.

Mr. FISH. That is right.

Mr. SHANLEY. And I would call attention to the fact that the word "munitions" has been used interchangeably with "ammunition." "Munitions" means raw materials, and "munitions" has been designated by the Wickersham Committee as being raw materials. Ammunition has been defined as distinctly and dogmatically weapons of war, but munitions, by the report of the Attorney General, has been used to include raw materials. That is the danger in these treaties. They use military supplies and they use material for warlike purposes. The terms arms, ammunition, and implements of war cannot be interpreted to mean or comprise "raw materials." Munitions, on the other hand, has been interpreted by Attorneys General McReynolds and Gregory in 1913 and 1915 to include raw materials used in the manufacture of such weapons.

It is felt that the above exchange by members of the House is of interest to the producers of raw materials in which are included the products of mines

As the result of negotiations extending over several months, the Commissioner of Internal Revenue who is charged with the duty of collecting the Social Security Taxes, has ruled that such taxes under Titles VIII and IX of the Act shall apply only to the "wages' of contract miners, after the cost of ex-plosives and other supplies have been deducted from the gross earnings. This ruling is important because it has removed what would otherwise have been an extremely unjust tax, amounting to 9 percent on the cost of explosives and miner's supplies.

As to revenue legislation in the present session of Congress, the Senate and House leaders have recently again declared against any increase in taxes. It is expected that the excise or "nuisance" taxes will be reenacted and there is some reason to believe that a certain degree of relief will be granted under the undistributed earnings tax on corporations. The staff of the Joint Committee on Internal Revenue Taxation is studying the inequities of the present tax laws and expects to recommend some simplification.

#### Profit Sharing Plan

Fairbanks, Morse & Company have announced the adoption of a profitsharing plan for employes, which will be retroactive to January 1, 1937. Under the plan employes who on April 1, 1938, have been in the company's employ since January 1, 1937, will participate in the annual net profits after provision is made for a return of 7 percent on invested capital.



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ZELIENOPLE PENNSYLVANIA

# News and Views

# of Interest to Mining Men

#### New Mill to Start

United Mines, Inc., has leased the Easy Money mine, in the Joplin field, and expect to immediately put the property into production. The company plans to dewater the mill shaft and to re-equip the mill with the most modern and up-to-date equipment. George W. Moore, of Joplin, Mo., is president of the company.

#### Navy Copper Awards

The Navy Department on March 7 announced contract awards to several companies for 1,700,000 lbs. of copper ingot, American Smelting & Refining Company received contract for 200,000 lbs.; Kennecott Copper Corporation, 500,000 lbs.; Nichols Copper Company, 300,000 lbs.

#### Stockholders Meeting

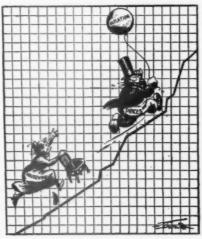
Stockholders of Appalachian Coals, Inc., held their annual meeting at Cincinnati, Ohio, on February 26. James Bonnyman, president of the Blue Dia-mond Coal Company; J. E. Butler, general manager of Stearns Coal & Lumber Company; John C. Cosgrove, president of W. Va. Coal & Coke Corporation; W. J. Cunningham, president, Crummies Creek Coal Company; L. A. Eavison, president, New Jellico Coal Company; C. C. Dickinson, president, Dickinson Fuel Company; Arthur Downing, general manager, Monitor Coal & Coke Company; Howard N. Eavenson, president, Clover Splint Coal Company; J. D. Francis, president, Island Creek Coal Company; V. N. Hacker, president, Pruden Coal & Coke Company; Calvin Holmes, president, Holmes-Darst Coal Corporation; J. A. Howe, executive vice president, Truax-Traer Coal Company, comprise the membership of the new board of directors. R. E. Howe is vice president of Appalachian Coals, Inc. Other members of the board include: S. B. Johnson, president of the Lorain Coal & Dock Company; H. E. Jones, president of the Amherst Coal Company; R. H. Knode, president, Stonega Coke & Coal Company; A. F. Leckie, president, Leckie Coal Company; E. C. Mahan, president, Southern C. & C. Company; C. A. Moriarity, president, Cabin Creek Coal Company; L. H. Randall, president, Randall Fuel Company; W. M. River, Red Jacket Coal Corporation; J. N. Snider, vice president, Consolidation Coal Company; C. W. Watson, president, the Elkhorn Coal Corporation; L. E. Woods, president, Crystal Block Coal & Coke Company; and J. P. Wil-

liams, president, the Koppers Coal Company.

#### Northern Minnesota Engineers Meet

The twenty-third annual banquet of the Engineers Club of Northern Minnesota met at Eveleth, Minn., on February 20. Nearly 200 were present, representing practically every mine in the district. Officers of the club are: D. A. Millman, president; P. L. Hendricks, vice president; E. C. Johnson, secretary and treasurer.

### WHERE A LITTLE SIT-DOWN MIGHT HELP!



-The Washington Daily News.

#### Kennecott Secures Ohio Copper Property

Stockholders of the Ohio Copper Company have approved sale to Kennecott Copper Corporation of certain properties for \$600,000, according to recent announcements. The transaction, it is expected, will be consummated in a week or 10 days.

The property will be used primarily to facilitate the construction of the new Bingham Canyon tunnel through Utah Copper Company holdings by Kennecott Copper Corporation and also for dumping purposes.

#### Iron Mining Wages Advance

In a report on the situation on the iron ranges, Skillings' Mining Review announces that a wage increase and hourly work week to correspond with the

recent adjustments in the steel industry has been promptly extended to the Lake Superior Iron Mining District, effective March 16. LeRoy Salsich, president of the Oliver Iron Mining Company, recently made the following official statement: "After the conclusion of the negotiations with employe representatives, the Oliver Iron Mining Company announces a general wage increase for all wage earners, effective March 16. It is understood that the base wage rate will be increased to \$5 per day, with adjustments in all other rates, and that a 40-hour week will be established with pay of time and a half for overtime in excess of 8 hours a day and 40 hours in any one week." This announcement was immediately followed by similar announcements from important producers, including: Pickands Mather & Company, Republic Steel Corporation, M. A. Hanna Company, Cleveland Cliffs Iron Company, Snyder Mining Company, Inland Steel Company, Oglebay Norton & Company, Butler Bros., North Range Mining Company, Davidson Ore Mining Company, Clement K. Quinn & Company, John A. Savage & Company, Interstate Iron Company, and others.

#### New Ore Washer

Manganiferous Iron Company, on the Cuyuna Iron Range, has announced that its new Merritt ore plant will be ready to receive ore during April.

#### Hanna Record

According to Hanna Coal News, the 1936 employe, exclusive of clerical force and officials, earned an average wage of \$1,484.60. Total payroll was \$3,118,973.14. Man-hours of work amounted to \$45,338, which made the average of \$5.71 per man. The mines worked on an average of 260 days for the year.

#### Bonus to Encourage Mining

The Government of Ontario will increase its per ton bonuses on iron ore. This action brings the total bonus to \$1 per ton on ore mined in the province. It is believed such a bounty will stimulate interest in exploration for Ontario iron ore. The existing bonus is 1 cent per unit of iron, and the new rate will increase this to 2 cents per unit.

#### Mining Department Meets

Officials and operating men of the Cleveland Cliffs Iron Company met at Ishpeming, Mich., on February 18 to develop plans for the coming season. Those in attendance were E. B. Greene, president; A. C. Brown, vice president; S. L. Mather, vice president; V. P. Geffine, vice president; and S. R. Elliott, manager of the company's mining department. Superintendents from the Minnesota and Michigan ranges were also present.



#### Unusual Safety Record

With the recent announcement of awards for the twelfth annual accident prevention campaign of the Associated Industries of New York State, the General Advisory Committee, meeting in Buffalo, paid tribute to a unique safety record of Mica Insulator Co., of Schenectady, N. Y. An award was made to the Mica Insulator Co. for completing

the 1936 campaign with a 100 percent record of no lost-time accidents. In addition they were awarded a special trophy for having completed the last five annual campaigns with the same record. With the closing of the 1936 campaign, the Mica Insulator Co., has now completed seven consecutive years without any lost-time accidents during the campaign periods.

#### Mining at Noranda

A graphic picture of the courage, perseverance, and technical skill required to bring a big mine into operation was told at the annual meeting of the Canadian Institute of Mining and Metallurgy in Montreal on March 15, when Oliver Hall, assistant general manager of Noranda Mines, Ltd., presented a paper on "Mining at Noranda."

Describing the discovery of Noranda by Ed. Horne in 1922, Mr. Hall showed how faith in the enterprise when profits were only a hope turned Noranda from only a promising prospect to one of the greatest mines in Canada in the short space of 10 years.

Today, Noranda mines about 2,000,000 tons of ore each year, or about 6,500 tons daily. If costs can be maintained on the present basis, the mine has ore reserves for 17 years. At the end of 1936, the mine had 2 miles of shafts, 34 miles of drifts and tunnels, 40 miles of raises, and had finished 80 miles of diamond drilling. About 700 men are employed underground. Mining costs average about 90 cents per ton, while development cost, including diamond drilling, is about 30 cents. Mr. Hall paid high tribute to the skill of the geological, mining, and milling staff, all of whom work

in closest cooperation. The mill treats 3,000 tons of ore daily, reducing this to 500 tons of concentrates, while the smelter handles these concentrates as well as 1,400 tons of high-grade sulphide ores and about 1,200 tons of silica flux. Thus in the short space of 15 years a "moose pasture" has become the site of one of the most prosperous towns in the Northland.

#### Tri-State Miners' Wages

Advances in ore prices during early March resulted in another general pay increase to mine and mill employes in the Tri-State lead and zinc fields. This establishes the highest wage level in the history of this mining field. The last increase amounts to 25 cents a day to miscellaneous labor. Virtually every large company in the field has joined in posting notices of increases.

#### Companies Merged

The Utah Apex Mining Company on March 13 voted to merge with the Utah Delaware Mining Company, thus forming the new National Tunnel and Mines Company, which will produce copper, lead, and zinc from mines in Utah and California.

#### The Galvanizers Committee

The second meeting of The Galvanizers Committee will be held at the Hotel Statler, St. Louis, Mo., on Monday, Tuesday and Wednesday, April 26, 27 and 28. On Monday, the Committee will attend the morning session of the nineteenth annual meeting of the American Zinc Institute, to hear the report on the Institute's promotional program. afternoon, the Committee will hold a round table conference, which will be open only to members of The Galvanizers Committee. On Monday evening, there will be a dinner and entertainment for the members and guests of The Galvanizers Committee and the Zinc Institute. The guest speaker will be an outstanding member of the steel industry. On Tuesday, The Galvanizers Committee will meet with members of the zinc industry at both morning and afternoon sessions. The platform will be shared. and a number of technical papers on carefully chosen subjects will be presented. There will be an informal smoker and buffet supper on Tuesday evening. On Wednesday morning a program is being planned for The Galvanizers Committee, when a number of interesting papers will be presented and discussed. A short business session will follow. In the afternoon, all are invited to visit the new hot and cold strip mills and galvanizing department of the Granite City Steel Company.

#### Wage-Hour Agreement

Arthur Roeder, president of the Colorado Fuel & Iron Corporation, has announced that his company will follow the move of the steel companies with wage-hour agreements for its 7,000 Pueblo employes. These increases will be based upon cost of living in this area and a possible 40-hour week.

#### WILL SOMEBODY KINDLY STRIKE UP THE STAR SPANGLED BANNER?



-The Washington Daily News.

#### **Coal Contest**

Hanna Coal Company has entered the Amateur Contest in connection with the coal convention and exposition of the American Mining Congress. Their March issue of Hanna Coal News says, "The second annual Hanna Amateur Contest, which last year packed the highschool auditorium at St. Clairsville with the largest crowd that ever attended an event here, has been set for the night of April 2." Contestants from each of the Hanna mines will be given a chance to compete for a big array of prizes that will be awarded to each and every participant. Among the judges will probably be Gov. Martin L. Davey, of Ohio. Prizes will include a trip to Cincinnati next May to compete in the nationwide contest sponsored by the American Mining Congress, and a possible chance to appear over a nation-wide radio hookup.

#### **Engineers Meet**

A dinner meeting of the Tri-State Section of the American Institute of M. & M. Engineers was held on March 26. W. M. Weigel, mineral technologist for the Missouri-Pacific Railroad, and George C. Smith, assistant to the president of the Missouri-Kansas-Texas Railroad, were the principal speakers. They discussed "The Relation Between Mineral Deposits and Major Systems of Transportation."

#### New Ore Boat

Cleveland Cliffs Iron Company recently purchased a new steamer—the G. G. Barnum. This brings this company's fleet of boats to 23. This fleet moved over 7,000,000 tons of iron ore and handled a considerable amount of coal during the past season.

#### Elaborate Program for National Purchasing Agent's Convention

Plans are taking shape for an elaborate program to feature the twenty-second annual international convention of the National Association of Purchasing Agents, which is to be held at the William Penn Hotel, at Pittsburgh, Pa., on May 24 through May 27. Between 1,200 and 1,400 members are expected to attend this convention. Groups of delegates are to be conducted on tours through a number of Pittsburgh's biggest mills and plants. A committee on plant visitation also is working on a varied program of tours through industries, research laboratories, etc.

#### New Drainage Tunnel

About three months ago the Pocahontas Fuel Company, of Pocahontas, Va., celebrated one of the most noteworthy accomplishments in the history of coal mining in this country. It was the completion of the world's longest minedrainage tunnel. It is 18.6 miles in length and drains 12,000 acres, or 190,-

000,000 tons of coal, which is nearly one-half of the 400,000,000 tons of unmined reserves. The tunnel passes through Pocahontas, Boissevain, Bishop, and Amonate, in Virginia; and also takes in Jenkinjones, W. Va.

#### Lead Plant Addition

E. W. McMullen, director of the research laboratories of the Eagle-Picher Lead Company, has announced plans for the construction of a large addition to the Joplin plant. Upon completion of the new unit, the present paint research laboratories, now located at Cincinnati, Ohio, will be moved to Joplin and the staff transferred to that point.

#### General Superintendents Meet

A general meeting of the superintendents of the Oliver Iron Mining Company was held at the executive offices of the company in Duluth on March 10. Each district of the company was represented.

#### AND DON'T SPARE THE HORSES!



-The Washington Daily News.

#### Mining Classes

B. W. Wilson, of Ohio State University, will conduct classes in the practical art of coal mining for employes of all the Hanna Coal Company's mines. Diplomas presented, similar to those received by students at the university, will be awarded to employes who complete the course of study.

#### Coppermines to Ship Ore

J. B. Haffner, general manager of the mines for the Consolidated Coppermines Company, recently said that "The property will be shipping at the rate of 3,000 tons per day during April." It was also indicated that a settlement of the litigation between Nevada Consolidated Copper Company and Coppermines may be adjusted.

#### Anthracite Shipments-February, 1937

Shipments of anthracite for the month of February, 1937, as reported to the Anthracite Institute, amounted to 3,042,496 net tons. This is a decrease, as compared with shipments during the preceding month of January, of 631,109 net tons, or 17.18 percent, and when compared with February, 1936, shows a decrease of 2,891,227 net tons, or 48.73 percent.

#### Complete Coverage

According to the National Industrial Conference Board, approximately one-half of the total working population is covered by old-age benefit provisions of the Social Security Act.

Mining and forestry represent the largest percentage of workers covered in the industrial group, with 95.8 percent; manufacturing and mechanical industries follow, with approximately 90 percent coverage.

#### Statistics of State School Systems

Nearly 10,000,000 of America's total public school population of 26,000,000 are enrolled in schools of six states—New York, Pennsylvania, Illinois, Texas, Ohio, and California—according to statistics of state school systems. New York and Pennsylvania school enrollments are more than 2,000,000 each, while Illinois, Texas, Ohio, and California report the only other state school enrollments of 1,000,000 or more.

Eight states each have public elementary and high-school student bodies totaling fewer than 100,000. These states are Nevada, 19,365; Delaware, 45,948; Wyoming, 55,841; Vermont, 66,176; New Hampshire, 77,753; New Mexico, 92,449; Arizona, 92,781; and the District of Columbia, 94,112.

The total public elementary and highschool enrollment in 1934, according to the Office of Education report, based upon State Department of Education statistics, was 26,434,193. Including at least 2,691,033 enrollments in private and parochial schools, the total number of children attending elementary and secondary schools was 29,125,226. If this number of school children stood in line, each child occupying a 1-ft. space, the line would be 5,516 miles in length, according to E. M. Foster, Chief of the Office of Education Statistical Division.

#### Iron Ore Shipments

Shipments from iron mines in the Lake Superior Region during 1936 amounted to 45,203,672 gross tons, according to figures recently released by the Lake Superior Iron Ore Association. One hundred and thirty-three mines were active in 1936. This compared with 122 in 1935 and 121 in 1934. Ten mines in the Lake Superior Region shipped in excess of a million gross tons during the year.

#### Marketing Steam Coals

Men who have spent years in studying the application and utilization of steam coals participated in a symposium, "Marketing Steam Coals," held on March 22 at Cincinnati, Ohio. This conference, the eighteenth in a series of similar meetings, was sponsored by the fuel engineering division of Appalachian Coals, Inc. J. E. Tobey, the agency's chief engineer, presided.

Speakers were chosen for their ability to discuss the engineering phases of the use of coal for generating steam.

H. A. Glover, Cincinnati, assistant to president, Island Creek Coal Sales Company, discussed the "Purchase and Sale of Coal by Steam Cost Evaluation."

B. E. Tate, chief engineer, Nation Cash Register Company, Dayton, Ohio, presented "The Use Value Versus the Scientific Value of Coals for Steam Generation."

C. E. Payne, New York City manager of the new fuel consultation service department, Consolidation Coal Company, described "The Relation of Burning Equipment to Coal Selection."

Many executives of Appalachian companies, including the following from six states, participated in the discussions of the three foregoing subjects:

M. L. Patton, vice president, Cabin Creek Consolidated Sales Company; W. J. McKinney, vice president, Randall Fuel Company; R. C. Fitzgerald, vice president, the West Virginia Coal & Coke Company; L. A. Davison, vice president, Walter Bledsoe & Company; Fred E. Gore, vice president, Blue Diamond Coal Sales Company; and R. H. Kelly, executive vice president, the Elk Horn Coal Corporation, all of Cincinnati.

F. H. Riggs, vice president, Amherst Fuel Company, Charleston, W. Va.; C. C. Dickinson, Jr., Dickinson Fuel Company, Charleston, W. Va.; H. B. Baird, vice president, the Koppers Coal Company, Pittsburgh, Pa.; G. A. Miller, general sales agent, Peabody Coal Company, Chicago, Ill.; W. A. Ellison, vice president, Southern Coal & Coke Company, Knoxville, Tenn. H. E. Cohn, vice president,

H. E. Cohn, vice president, the S. J. Patterson Company, Dayton, Ohio; J. M. Daniel, sales manager, Stearns Coal Sales Company, Stearns, Ky.; R. W. Gruesser, sales manager, Red Jacket Coal Sales Company, Columbus, Ohio; T. E. Coleman,

## SUBJECTS ON PROGRAM ANNUAL COAL CONVENTION THE AMERICAN MINING CONGRESS

Stream Lining Mine Ventilation

Material Handling and Conservation of Mine Supplies Underground

Cutting Requirements for Conveyor Mining Barrier Pillars to be Left in Mines

Mining Under Flood Conditions in the Anthracite Field

Advantages of Sectionalizing Power by Use of Automatic Circuit Breakers

Communication Systems in Mines

Use of Battery Locomotives in Thick Pitching Seams

Waxolized Treatment of Coal

Effect of Mechanical vs. Hand Loading on Degradation of Coal

Face Preparation for Mechanical Loading

Advanced Mine Rescue Training Courses

Mining Systems for Extracting Pillars

Mercury Arc Rectifiers for Coal Mining Service

Shearing as an Aid to Mechanical Loading

Results from Operation of Mine Power Plant Mechanical Loading on Conveyors

Bringing Safety Home to the Miner

Recent Developments in Truck Haulage in Strip Mines

Transportation by Underground Conveyors and Aerial Trams

Modern Mine Drainage

Mining Extension Courses of Various Universities

New Developments in Mechanical Loaders

Definition of Terms-Power Factor, Load Factor,

Safety Bonuses, Load Demand

The Future of Mechanical Mining

A coal cleaning symposium will present:

Dewatering Screens and Heat Driers

Coal Washing Tables

Modern Screening and Dedusting Practice

Methods of Cleaning Strip Coal

Preparation of Coal in the Anthracite and in the Alabama Fields

The Future of Mechanical Mining

Merchandizing Anthracite

Securing Team Work between Management and

A Comprehensive discussion on Bituminous Coal Research assistant to president, Black Star Coal Sales Company, Louisville, Ky.; R. C. Gilbert, vice president, Lorain Coal & Dock Sales Company, Cleveland, Ohio; Calvin Holmes, president, Holmes-Darst Coal Corporation, Knoxville, Tenn.

#### Tailing Mill

Commerce Mining & Royalty Company will construct a new tailing mill on its Anna Beaver property, and construction was started early in March. The mill will be similar in design and size to that of the Captain Milling Company, the largest mill of its kind in the district, and will have a capacity of 125 tons an hour.

#### New Enquipment Ordered

The M. A. Hanna Company has recently ordered a 17-ton caterpillar tractor for its Mesabi Chief mine. The Cleveland Cliffs Iron Company has ordered a 10-ton Diesel tractor for its Hill Trumbull open-pit mine. The Oliver Iron Mining Company will install a 17-ton Diesel caterpillar tractor at its Minnesota properties.

#### T. C. I. & R. R. Company Increases Wages

The Tennessee Coal, Iron and Railroad Company has announced wage increases, the adoption of the 40-hour work week, and time and a half for overtime for its 15,000 employes. Officials of the company estimate that the increases will average about 15 percent. This decision affects all employes except coal miners. Woodward Iron Company, also located in the Birmingham District, stated that it would immediately announce similar increases.

#### Annual Meeting

Rocky Mountain Coal Mining Institute has scheduled its annual meeting to be held at Denver, Colo., during the month of April.

#### Resumes Operation

Tamarack and Custer Consolidated Mining Company, controlled by the Day interests of Idaho, has announced the immediate resumption of operations at its properties on Nine Mile Creek. These properties were the fourth largest producers in Idaho in 1929, and considerable interest is attached to their reopening.

#### Anthracite Industries, Inc., Announces Expansion of Program

The outstanding news of interest in the address of F. W. Earnest, Jr., president of Anthracite Industries, Inc., at the recent Pennsylvania Retail Coal Merchants' Convention, Reading, Pa., was that, effective March 15, additional field men will be placed in various sections of the country to work more closely with coal merchants and equipment dealers.

Of great interest was the announcement that a large permanent showroom will be opened in Philadelphia within the next two months. This display room will show all types of improved modern anthracite - burning equipment and the latest in cellar modernization. Parts of the display room will be air-conditioned with anthracite equipment. The display room will be located in a prominent part of the city, and men will be in constant attendance to explain the many advantages of modern anthracite equipment to the thousands of visitors. The men in charge will work with coal merchants, equipment manufacturers and dealers, and the heating trade to promote the larger sale of anthracite equipment,

A new permanent showroom will also be placed in Boston, Mass., within the next two months. Anthracite Industries, Inc., is working with coal dealers and heating contractors in many other cities, so that as fast as possible showrooms will be available in every major city. In smaller cities Anthracite Industries, Inc., will assist dealers in setting up their own displays.

Mr. Earnest announced that March 15 will be the starting date of an intensive drive all over the country for modern automatic anthracite water heaters.

More men have been added to Anthracite Industries, Inc., to contact manufacturers of equipment, to give them every possible assistance in the development and improvement of anthracite equipment and to assist manufacturers in a wider distribution of their products. The response and cooperation received



The palatial Kearns' home, shown above, recently was donated to the State of Utah by Mrs. Jennie J. Kearns, widow of the late State Senator Thomas Kearns, as a governor's mansion. The gift was promptly accepted by both branches of the leigslature. The residence, long a landmark in Salt Lake City, is located at 603 East South Temple Street.

from manufacturers is exceptionally gratifying. Particular emphasis is being laid on contacts with the space heater manufacturers—which equipment was formerly known as "base burners." New and improved models, as attractive as any radio cabinet, will soon be placed on the market, and through the cooperation of the entire field force of Anthracite Industries, Inc., and the salesmen of producing companies, will be made available through many outlets to the consuming public.

Mr. Earnest pointed out that the anthracite problem is comparable to the artificial-ice industry. From an average tonnage of approximately 60,000,000 tons in 1928, they dropped to 37,000,000, and at the end of last year had moved forward again to 48,000,000 tons. Their program has been in operation for about four years. It has taken time, but they have done a successful job. They did not merely go out to talk about why the public should use artificial ice. They decided to make ice more attractive to use and more convenient and economical. They developed a modern top-icer, a more efficient icebox that required filling only once every two or three days, even in extremely warm weather. Anthracite Industries, Inc., is building their program along the same lines by featuring new, modern, improved anthracite-burning equipment.

It was pointed out that the research laboratory at Primos has been enlarged and that almost every day manufacturers are sending equipment into the laboratory, not only for testing but to secure the suggestions and recommendations of anthracite engineers to further improve the models submitted. This

equipment includes everything that burns anthracite coal, starting with base burners, or space heaters, automatic anthracite water heaters, fireplaces, cooking stoves, warm-air furnaces, boilers, magazine-feed heaters, stokers, and various types of air-conditioning equipment.

Mr. Earnest announced that the reports from the various large Federal Housing shows that are being held throughout the country are exceptionally gratifying and that more manufacturers are exhibiting in the large anthracite show at each exhibit.

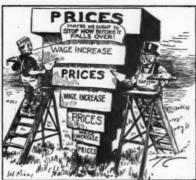
The large newspaper advertising campaign running in 68 cities is being continued and will run through until spring. With each ad, more and more coal merchants, equipment manufacturers and equipment dealers are running space alongside of the Anthracite Industries, Inc., ads so that in almost every city there is a full-page ad devoted exclusively to the advantages of anthracite as a fuel when burned in modern equip-Sales of thermostats, or heat ment. regulators, are continuing to go up and all companies report sales have doubled over last year. Mr. Earnest again mentioned the splendid support of the anthracite-producing companies who have definitely tied their advertising in with the general theme of the Anthracite Industries, Inc., program.

#### 'TWAS HE!



-The Evening Star.

J. M. Daniel, sales manager, Stearns Coal Sales Company, announces that Fred J. Ettinger is now representing the company in Michigan. Stearns Coal Sales Company is agent for Stearns Coal & Lumber Company.



-The Evening Star

#### Honor Award

The platinum medal of the Canadian Institute of Mining and Metallurgy was awarded, in Montreal, at the annual meeting of the institute, to A. L. Blomfield, managing director of Lake Shore Gold Mines, Ltd. This medal was established in 1933 to commemorate the fiftieth anniversary of the nickel industry in Canada, and is awarded from time to time "as a mark of distinction and recognition to the person who has made a meritorious and practical contribution of outstanding importance to the mining and metallurgical industry of Canada." The medals are discs of pure platinum, 3 in. in diameter and weighing 14 oz. each. They are struck from a design made by Dr. Tait Mackenzie, noted Canadian sculptor.

Mr. Blomfield, the 1937 recipient, was born in Australia, in 1879, and is a graduate of the Engineering School of Melbourne University. He began his career as a mining engineer in the Great Cobar copper mine, and then for several years served Bewick Moring & Company on various gold properties in western Australia. His success in treating complex and difficult ores led to his being called to this continent, where he prac-ticed at Cripple Creek, Colo., and later at Chihuahua, Mexico. He then returned to Colorado and was employed there for 17 years as superintendent and manager of the Golden Cycle mill, Colorado Springs, and general manager of the Cresson gold mine. During this period he developed the tray thickener and bowl classifier, which are now used in gold fields the world over. After subsequent engagements with San Francisco principals in Arizona and California, Mr. Blomfield returned to his native Australia with the intention of retiring and living on his ranch, but in 1933 he accepted his present position as managing director of the Lake Shore mine, in northern Ontario.

#### Hill Trumbull Mine

The Hill Trumbull open-pit mine of the Cleveland Cliffs Iron Company, which has not shipped ore since 1931,

will resume shipments this season. Among the new equipment ordered to put this property in shape is a new Marion electric shovel equipped with a 2-yd. dipper.

#### **Emergency Conservation Work**

Robert Fechner, Director of Emergency Conservation Work, announces that approximately 100,000 young men and war veterans will be given an opportunity to enroll in the Civilian Conservation Corps during the first 20 days of April. These new enrollees will be utilized as replacements to fill vacancies which will exist in the corps on March 31, when the fourth year CCC work is brought to a close. The director stated that the operating program for the beginning on April 1 of the corps' fifth year of activity provides for the opera-tion of 2,002 CCC camps and the maintainance of the enrolled strength of the CCC at 350,000 men, exclusive of approximately 8,000 Indians working on Indian reservations and 4,500 territorials assigned to camps in Alaska, Puerto Rico, the Virgin Islands, and Hawaii. Reports from the various camps indicate that the discharge of men who complete their terms of enrollment on March 31, coupled with the discharge of men to accept private employment, will reduce the enrolled strength of the corps to 250,000 by April 1.

#### Coeur d'Alenes Active

Hecla Mining Company, owning one of the chief mines in the Coeur d'Alenes, with other subsidiary interests, showed a 1936 profit of \$1,137,200 after deducting all charges except current taxes and depletion, compared with a profit of \$907,228 on the same basis in 1935, James F. McCarthy, president, reports. During 1936 the company paid \$600,000, or 60 cents a share, in dividends. At the close of the year it was on a quarterly dividend rate of 20 cents a share, and it opens 1937 with the same rate, with a payment of \$200,000, or 20 cents a share, March 15, for the first quarterly dividend.

The mine operated, in 1936, 261 days, making a production of 256,747 tons of ore, compared to 241 days in 1935, with a production of 245,635 tons. The mine had four years developed ore ahead at the end of 1936, and was preparing to sink from the 3,200-ft. present low level to the 3,600-ft. level.

Hecla and Bunker Hill companies jointly own the Sullivan Mining Company, which owns the Star mine and is building a 750-ton mill to treat Star ores, mostly zinc. This new mill is due for completion in May. Hecla, with the cooperation of Newmont Corporation, is also building a 200-ton plant to handle the Polaris ore, it owning a controlling interest in the Polaris stock.

Stanly A. Easton, president of Bunker Hill, and James F. McCarthy, president of Hecla, have been put on the board of directors of Douglas Mining Company,

which is to resume operations on Pine Creek, in the Coeur d'Alenes.

Sullivan Mining Company is operating its electrolytic zinc plant at its utmost capacity, producing 2,000 tons of refined zinc a month. The fact that the company already has zinc receipts sufficient to keep the electrolytic plant running at full capacity suggests that the company may enlarge the zinc plant.

#### Utah Chapter Elects Officers

Officers of the Utah Chapter, American Mining Congress, were re-elected as follows at the annual meeting held March 20, 1937:

Governor—O. N. Friendly, vice president and general manager, Park-Utah Consolidated Mines Co.

First Vice Governor—E. A. Hamilton, general manager of mines, United States Smelting, Refining and Mining Co.

Second Vice Governor—James Ivers, vice president and general manager, Silver King Coalition Mines Co.

Third Vice Governor—W. J. O'Connor, manager, American Smelting and Refining Co.

Secretary-A. G. MacKenzie.

#### Illinois Operators Receive Miners' Proposals

The United Mine Workers of America. through Local District No. 12 for the State of Illinois, has presented wage proposals to the Illinois operators which are quite similar to those presented by the miners to the operators in the Appalachian Range, except that in Illinois the U. M. W. A. asks that its union be recognized as the sole collective bargaining agency for all Illinois miners. This request, of course, is brought about by the existence of the Progressive Miners Union of America, and reports from Illinois today are to the effect that if the U. M. W. A. proposal is insisted upon it is quite likely that serious trouble may develop due to the fact that some contracts are in existence between the Illinois Coal Operators Association and the Progressive Miners Union, the same as contracts exist between the Operators Association and the United Mine Workers. The six-hour day, five-day week is requested; the 200-day guarantee, the two weeks' vacation period, and the provision against child labor, minimum 18 years of age, etc. A conference was held between representatives of the union and the operators on the 11th. W. J. Jenkins was elected chairman; D. W. Buchanan, vice chairman; Walter J. James, secretary. (The latter is secretary and treasurer of the Mine Workers Union.) A motion was adopted by the meeting empowering the chairman and secretary to appoint a subcommittee of six members from each side to start negotiations when called together. The conference is subject to the call of the chairman .-National Coal Asso. Bulletin.

#### **Tunnel Construction**

Pend Oreille Mines and Metals Company ran a race against sunshine and river in the construction of its tunnel and plant, which will furnish the company with 2,000 hp., much needed for the operation of its mine, mill, and subsidiaries. By the middle of March the Pend Oreille River was very low, instead of having started to rise, and it was evident construction was so far along at Metaline Falls, Wash., that no damage would be done by high water. The 670ft. tunnel, through the rock on the east side of the river, was nearing completion, as was the powerhouse. The cement company at Metaline Falls has its own power from Sullivan Lake, and in the past has had a substantial surplus, which it turned over to Pend Oreille Mines and Metals Company. This year the cement company had a heavier production than for 20 years and had less power because of the low water in the lake. The mining company has some power from a small stream near by, but its total power this season was so small that its milling operations dwindled to nil. With the completion of its new power plant the company will have ample power for its mine and mill operations, for the development of its subsidiary, the Reeves Mc-Donald mine, across the Canadian line, and perhaps for other uses. All these enterprises will be going in full force by midsummer.

#### **New Tipple**

The Colony Coal Company, Rock Springs, Wyo., has started construction on a new tipple, at its Peacock mine. It is estimated by officials of the company that the tipple will cost approximately \$150,000. It will be modern in every respect and will be built by McNally Pittsburg Mfg. Company, of Chicago.

New Mexico School of Mines, State Bureau of Mines & Mineral Resources, Socorro, N. Mex., has just released Bulletin 12, "The Non-Metallic Mineral Resources of New Mexico and their Economic Features (Exclusive of Fuels)" by S. B. Talmage and T. P. Wootton.

Fred Darragh, formerly with Hatfield-Campbell Creek Coal Company, is now representing Cabin Creek Consolidated Sales Company in eastern Michigan and northern Ohio, according to recent announcement of M. L. Patton, vice president.

#### Wage Increase in Coeur d'Alenes

Wages of men employed by the large mining companies of the Coeur d'Alenes were raised in March 50 cents a day. Wages in the district have gone up and down at a fixed rate as the price of lead has advanced or declined. This rule has governed many years. Under the new scale timbermen are paid \$6.75 per 8-hr. shift, miners \$6.25, shovelers \$5.75, common outside labor \$5.50. These wages apply at the Hecla, Morning, Page, Bunker Hill & Sullivan, Polaris, and at

Sullivan Mining Company's operations. The Sunshine, although not a lead producer, maintains a scale 50 cents higher than that of the other mines of the district. Approximately 4,000 men are affected by this order, which adds \$2,000 a day to the pay roll of the district.

#### 1937 Mineral Industries Conference To Be Held in October

Departing from the regular practice of an annual spring meeting, the fifth annual Illinois Mineral Industries Conference will be held at Urbana on Friday and Saturday, October 8 and 9, according to information received from the office of M. M. Leighton, Chief of the Illinois State Geological Survey.

In announcing the dates for the 1937 conference, Dr. Leighton indicated that all future meetings will probably be held in the fall, because of the fact that many people connected with the mineral industries of the state have not been able to attend some of the previous meetings, due to conflicts with other meetings involving their special fields of interest. The October dates were selected after conferences with a number of representatives of these industries.

Announcement of the program will be made later this spring.

#### Freight Rate Case Gets Under Way March 23—Coal Commission Presents Evidence

Shippers were recently heard before the Interstate Commerce Commission in protests and objections to the carriers' demands for general rate increases on the "basic commodity list," which includes coal, coke, steel, iron ore, cement, lime, plaster, petroleum and affiliated products.

A highlight of the testimony was that presented by M. D. Harbaugh, vice president, and John B. Putnam, counsel of the Lake Superior Iron Ore Association. In a lengthy statement and accompanying statistical data it was shown that without any further increase, present rates on iron ore from Lake Superior district mines to upper lake ports are still too high. Details of carrier earnings and profits were read into the record, and a showing was made that existing discrimination against iron ore is such that shippers are charged more than two and one-half times as much for hauling a trainload of their commodity an average distance of 81.4 miles as is charged shippers of other commodities, including l.c.l. freight, for the hauling of an average miscellaneous train 255 miles.

Another witness for the mining industry was Louis Madeira, III, executive director of the Anthracite Institute. Mr. Madeira stressed the unfortunate rate situation under which anthracite is handicapped in its battle with imported fuels and "bootleg" production. He said that narrowing markets are evidence of the need for reductions rather than increases in freight rates.

The National Coal Association likewise presented data to prove that the

carriers' proposals are not justified. The National Bituminous Coal Commission presented evidence on behalf of the Commission showing that bituminous coal is required to pay freight rates that are out of line with the value of the service as well as contrary to public interest. C. E. Bell, traffic analyst, presented evidence on behalf of the Commission.

Hearings are expected to continue for several months on the basic commodity list.

The forty-sixth general meeting of the American Iron and Steel Institute will be held May 27, 1937, at the Hotel Waldorf-Astoria in New York City.

C. F. Hardy, a steam power engineer, has been added to the fuel engineering staff of Appalachian Coals, Inc. He received his mechanical engineering education at Purdue University; his experience in the New Castle (Ind.) power plant of Chrysler Corporation, where he has been located for eight years.

From many sources it has been reported that Charles F. Huber, administrator for the Anthracite Institute, will resign his position May 1. Mr. Huber is a director of the Glen Alden Coal Company, Lehigh and Wilkes-Barre Coal Company, Delaware, Lackawanna & Western Coal Company, Burns Bros., and the First National Bank of Wilkes-Barre, Pa.

#### **New Booklet**

Appalachian Coals, Inc., has recently distributed a new booklet entitled "Which End," presenting a new view on how to obtain "a comfortably heated home and full value for every fuel dollar."

T. A. Day, assistant secretary, Appalachian Coals, Inc., was the guest speaker at the recent public relations dinner sponsored by the Business and Professional Women's Club of Atlanta, Ga.

#### Link-Belt Elects Directors

At the annual meeting of stockholders of Link-Belt Company, held at the Stevens Hotel, Chicago, March 23, four directors were elected to severe until 1941.

The newly elected directors, Bernard E. Sunny, Chicago, and James S. Watson, Indianapolis, succeed Arthur L. Livermore, deceased, and Austin L. Adams, resigned. The re-elected directors are Staunton B. Peck, Chestnut Hill, Pa., and Harris Whittemore, Jr., Naugatuck, Conn.

Mr. Sunny is a director of a great many companies, among which are the General Electric Co., Illinois Bell Telephone Co., Public Service Co. of Northern Illinois, Wilson & Company, Chicago Surface Lines, and the First National Bank, Chicago. Mr. Watson is vice president in charge

Mr. Watson is vice president in charge of Indianapolis plant operations of Link-Belt Company, having served the company continuously for 44 years.

#### -Personals-

W. F. Phibbs, of the Columbia Steel Company, has transferred his headquarters from San Francisco to Pittsburgh, Pa.

Charles E. MacQuigg, for many years research engineer and metallurgist, manager of Union Carbide & Carbon Research Laboratories, Inc., New York City, has been appointed dean of the College of Engineering and director of the Engineering Experiment Station of Ohio State University. He will assume his new position about July 1, 1937.

Eugene McAuliffe, president, Union Pacific Coal Company, was a Washington visitor, March 23 and 24.

T. J. Thomas, president, Valier Coal Company, who has been sojourning in Florida, has returned to his Chicago

Robert F. Vogt, Allis-Chalmers Manufacturing Company, assistant chief consulting engineer since 1921, has been appointed chief consulting engineer, to succeed the late J. F. Max Patitz. He has been connected with Allis-Chalmers since 1907, entering as mechanical engineer, and has been connected with many activities relative to the design and development of sundry equipment of various departments.

Frank M. Woods, president of the Sahara Coal Company, is spending the winter in Arizona.

A. Y. Peterson has returned to Duluth after an extended vacation in Mexico. Mr. Peterson is president of the Oliver Iron Mining Company.

Oscar F. Ostby, director of merchandising for the Stevens Coal Company and president of Independent Anthracite Coals, Inc., was a speaker at the annual meeting of the Lehigh Valley Coal Association on March 18.

Rudolph Ericson, general superintendent of the Davidson Iron Ore Mining Company, is on vacation in Florida.

J. F. Joy, Sullivan Machinery Company, was in Washington, March 15, en route to southern coal fields.

Theodore T. Toole, for several years director of marketing for the Philadelphia & Reading Coal & Iron Company, has resigned to become affiliated with the Barber Company.



Barton R. Gebhart

Barton R. Gebhart, vice president of Chicago, Wilmington & Franklin Coal Company, addressed the South Dakota Retail Coal Merchants Association on March 9.

Clarence Stanley, vice president of the Union Trust Company, and Lawrence M. Murray, vice president of the Mellon National Bank, have been elected to the board of directors of the Koppers United Company, holding company for the Koppers Company.

Lewis Henry Boyd, son of Julian Boyd, of Los Angeles, Calif., has gone to the Philippine Islands, where he will be associated with Developments, Inc., as field engineer and geologist.

B. Smith, of the Consolidated Coal Company, where his work is that of combustion engineer, will deliver one of the addresses scheduled for the University of Illinois short course in coal utilization, to be held at Urbana, Ill., May 25, 26, and 27. "Bus" Smith is an ex-Northwestern University basketball star.

Cleveland E. Dodge, vice president, Phelps Dodge Corporation, has been in Arizona on an inspection trip of his company's mines.

E. R. Stettinius, chairman of the finance committee of the United States Steel Corporation, has been appointed to the Business Advisory Council by the Secretary of Commerce, Mr. Roper. He replaces Myron C. Taylor, chairman of the corporation's board.

C. A. Lemke has joined the staff of the Potash Company of America, and will be located at Carlsbad, N. Mex.

Guy N. Bjorge, Homestake Mining Company, Lead, S. Dak., has returned to Lead after an eastern trip. He was accompanied by Mrs. Bjorge. They visited their daughter, who is a student at Sweetbriar College.

W. W. Dartnell has been vacationing in Florida. He is chairman of the general committee on arrangements for the annual coal convention and exposition of the American Mining Congress.

W. D. Turnbull, Westinghouse E. & M. Company, conferred on March 18-19 with officials of the American Mining Congress in Washington and New York in connection with his work as chairman of the Entertainment Committee for the forthcoming Cincinnati convention and exposition of that organization. He states that the entertainment features will be more unusual and more interesting than ever.

E. L. Dana has joined the staff of the Haddock Mining Company and will be located at Wilkes-Barre, Pa.

D. I. Hayes, mining engineer, American Zinc Lead & Smelting Company, has transferred his headquarters to Spokane, Wash.

O. M. Bishop, formerly with the Shenandoah Dives Mining Company, has gone to the Philippine Islands.

W. R. Wade, formerly on the staff of the John Hays Hammond interests, has opened an office in San Francisco, where he will practice consulting engineering work.

Daniel Harrington, chief engineer of the Safety Division of the U. S. Bureau of Mines, and Andrew Fletcher, vice president and treasurer of the St. Joseph Lead Company, were recently elected trustees of the Air Hygiene Foundation.

E. F. Stevens, vice president, the Union Collieries Company, is again at his office after a vacation trip to Florida.

Justin Potter has been elected president of the West Kentucky Coal Bureau; J. H. Schneider was elected vice president. C. F. Richardson, West Kentucky Coal Company, is chairman of the executive committee.

Clinton H. Crane, president of the St. Joseph Lead Company, at the annual meeting of his company expressed the opinion that metal prices might go even higher than at present. He termed the current advances as unhealthy. Mr. Crane also foresees a possible shortage of lead in this country, particularly if the present demand continues and if prices continue upward. He stated that if prices go higher some lead products may be replaced by other products.

John P. Dyer, manager of the Nichols Copper Refinery, has been named vice president of all the company refineries.

S. B. McIntyre, formerly executive vice president of Cosgrove & Company, with offices at 550 Fifth Avenue, New York City, was recently elected president of his company.

C. A. Reed has been elected secretary of Bituminous Coal Research, Inc., according to announcement of John C. Cosgrove, president of the organization. Mr. Reed will assume the duties formerly undertaken by Oliver J. Grimes.

L. W. Shugg, General Electric Company, attended the annual convention of the National Railway Appliance Association held in Chicago the week of March 15.

Russell Clark Fleming, mining engineer, of Los Angeles, Calif., has joined the staff of Dr. H. Foster Bain in his work of developing a Bureau of Mines for the Philippine Government.

H. L. Scheiber has been appointed superintendent of the Newport and Cary iron mines of the Pickands Mather & Company properties, at Ironwood, Mich.

C. W. Nicholson, Eagle-Picher Mining & Smelting Company, was the principal speaker at the bi-monthly meeting of the Tri-State Mine Safety Council. Henry Giessing, safety engineer, Commerce Mining and Royalty Company, is chairman of the Council.

A. W. Allen, formerly connected with the McGraw Hill Publishing Company as editor of Engineering and Mining Journal, has returned to the United States from South America, where he has spent considerable time during the past year. He will open an office as consulting metallurgist and engineer on the Pacific coast.

Floyd Alexander has been appointed superintendent of the Yellow Aster cyanide plant at Randsburg, Calif. The property is under the direction of the Anglo-American Mining Corporation.

Robert S. Burton, formerly with the Empire Zinc Company at its Colorado properties, has gone to Peru to become affiliated with the Cerro de Pasco Copper Company.

J. M. Peters, manager of the Sultan Gold Mining Company, of Idaho, has been appointed mine manager for the Coeur d'Alene Mines Corporation.

James Prendergast, president, Susquehanna Collieries Company, has returned to his Philadelphia office after a trip to the Pacific coast.

Those attending a special conference on tax matters held in the offices of the American Mining Congress on February 20 were P. M. Arthur, American Zinc Lead & Smelting Co., Mascot, Tenn.; J. D. Battle, secretary, National Coal Association, Washington, D. C.; Guy N. Bjorge, general manager, Homestake Mining Co., Lead, S. Dak.; E. R. Clark, general auditor, Glen Alden Coal Co., Scranton, Pa.; R. F. Duckworth, auditor, Hudson Coal Company, 26 Liberty Street, New York City; F. M. Fisher, comptroller, Lehigh Navigation Coal Co., Philadelphia, Pa.; Frank Hildebrand, comptroller, Glen Alden Coal Co., Scranton, Pa.; Louis C. Madeira, III, executive director, Anthracite Institute, New York City; Walter Gordon Merritt, general counsel, Anthracite Institute, New York City; Joseph B. Miller, of counsel, Anthracite Institute, New York City; J. F. Riley, general assistant, Hudson Coal Co., 26 Liberty Street, New York City; Charles Seymour, Knoxville, Tenn.; Julian D. Con-over, secretary, American Mining Con-gress; and A. W. Dickinson, American Mining Congress.



R. V. Clay

R. V. Clay, Hanna Coal Company, advises that the Governor of Ohio, Martin L. Davey, will serve as one of the judges in the selection of their entry in the Miners' Amateur Contest, a feature of the Cincinnati Coal Convention, in May.

J. O. A. Carper and John T. Barnett, prominent Colorado mining men, were elected vice governors of the Colorado Chapter of the American Mining Congress at its January meeting. S. B. Collins was elected treasurer and Robert S. Palmer was re-elected secretary.

William C. Kinnon has joined the staff of the Humboldt Mines, Inc., whose properties are in Arizona.

Walter W. Bradley, state mineralogist for California, on January 8 celebrated a silver jubilee, marking his twenty-fifth year as a member of the staff of the California State Division of Mines.

Alexander C. Brown, vice president of the Cleveland Cliffs Iron Company, has been elected a director of the Republic Steel Corporation.

Albert Mendelsohn, general superintendent of mines for the Copper Range Company, has resigned his position to become affiliated with the Greene-Cananea Copper Company, a subsidiary of the Anaconda Copper Mining Company.

H. G. Molton was recently elected vice president of the American Institute of Mining and Metallurgical Engineers.

After more than half a century of active work in the anthracite region, principally with the Susquehanna Collieries Company, C. K. Gloman retired from service at the end of February this year.

Mr. Gloman was born in Wilkes-Barre and when about 10 years of age, started work as a slate picker in one of the breakers. When 16 years of age he secured work as a messenger boy in the office of Major Irving A. Stearns, manager of the Susquehanna Coal Company at Wilkes-Barre. Later he was further advanced to the position of Chief Clerk, and in 1924 was appointed to the positions of Purchasing Agent and Assistant to the General Manager, which positions he held at the time of his retirement on account of ill health. Early in December, 1936, he was tendered a testimonial dinner by associate officials of the company at the Westmoreland Club in celebration of 50 years of service .- (Anthracite Institute)

#### -Died-

Edgar D. Sutton, salesman for the Myers-Whaley Company, died on March 24. He had been associated with the company for a number of years. He was a graduate of Penn State College, had served on the staff of the U. S. Bureau of Mines, as Chief Engineer for the West Virginia Coal and Coke Company, and was at one time affiliated with Sloss-Sheffield Coal and Iron Company at Birmingham.

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# With the Manufacturer

#### Suspension Clamp With 0.7-in. Seat

Expanding its line of suspension clamps to provide the proper size for every need, the Ohio Brass Company, Mansfield, Ohio, has added a clamp with a 0.7-in. cable seat diameter. Thirteen clamp sizes, from 0.4 to 2.25 in., are now available. The new size is suitable for 350,000-circ. mil copper cable, 250,000-circ. mil copper cable with liners, 266,800-circ. mil steel-reinforced aluminum cable, or 4/0 steel-reinforced aluminum cable with liners. The clamp can be furnished with a J or U-bolt, with or without liners, and with or without a socket fitting. Its over-all length is 7½-in.



Made of O-B Flecto malleable iron, hot-dip galvanzed, the clamp is light in weight and therefore has a small inertia, a desirable feature from the standpoint of conductor vibration. The clamp seat is rounded and curved, and the keeper piece is so shaped that there is a constantly increasing pressure exerted on the cable from the point where the conductor enters to the center where maximum clamping action takes place. Surfaces are smooth and corners rounded to eliminate sharp edges which might result in the formation of corona at low voltages.

#### MSA Combustible Alarm Announced

Just off the press, a new bulletin by the Mine Safety Appliances Company illustrating and describing the MSA combustible alarm, an instrument for continuously sampling atmospheres where combustible gases and vapors may be present, and which provides an electrical warning when the concentration of flammable gases exceeds a predetermined limit. The brochure is available by writing this publication, or addressing the manufacturer direct at Meade, Thomas and Braddock Avenues, Pittsburgh, Pa.

#### **New Appointment**

F. O. Burkholder, vice president of the Ahlberg Bearing Company, Chicago, recently announced the appointment of P. H. Staerk as manager of their industrial division in charge of distributor and production sales of mounted bearings.

#### More Light and Power At Half the Cost

Electric light and power out of a gas pipe is the newest way for mine owners to cut their light bills in half or get twice as much light or power for less than their present electric bill.

Consequently the recent announcement of the Lycoming Manufacturing Company of Williamsport, Pa., of a gas motor generating unit engineered for 100,000 hours of continuous duty, and that permits these great savings, is of interest. Under Lycoming's plan the mine operator owns his own electric light and power plant and pays for it, plus operation costs, out of the savings on his present electric bill.

The perfecting by Lycoming of a natural gas motor of high efficiency and low operation costs together with an entirely automatic generating unit has made tremendous savings possible in the cost of electrical energy for those who pay \$50 or more per month for their light or power or both.

The plant is automatic in operation, and sizes range from 10 k. w. to 60 k. w., generating either alternate or direct current.

#### Increases Wages

The Timken Roller Bearing Company has announced an increase in wages and a reduction in working hours, which became effective March 16. The company employs about 3,000 workmen.

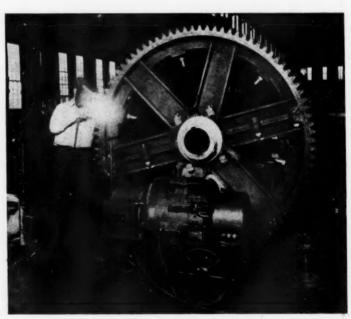
#### Link-Belt Company Invests in Humans

The Link-Belt Company of Chicago has solved successfully one of industry's greatest problems, that of training men to handle men. The idea originated in 1932, became effective in 1933, and is now operative in the seven plants of the company.

It is a 10- to 20-year plan to train young men not to learn a trade, but to learn a business; how the products of the company are made; their uses, marketing, and cost. It offers to young men a chance they are eager to accept, and results in the acquisition of the cream of the youth who are technical students at high schools and colleges. The plan, now in its fourth year in the Link-Belt organization, is successful from every viewpoint.

At present more than 100 young men are employed and in training in the various departments of the Link-Belt Pershing Road plant. With but an exception or two, these men are 25 years of age or younger. A few who were employed only for the summer, now have returned to public school or college, but are expected back in the Link-Belt plant or office next year. The training includes work in the drawing room, office, foundry, machine shop, pattern shop, steel shop, planning department, yard, or wherever any work is to be performed.

The present education of these ambitious young men ranges from grammar school, high school, trade and technical



High Powered Dentistry.—When a tooth broke on this large gear, a Westinghouse welder quickly put it back in service. The gear is part of a 300-hp. slope hoist at the Loomis colliery of the Glen Alden Coal Company.

school graduates to several years in college; in fact, quite a few are university graduates. Thirteen nationalities are represented. Similar employe training courses are also in effect at the company's other plants.—Reprinted from Central Manufacturing District Magazine.

#### Worthington-Gamon Bulletin

Three and 4-in. heavy-duty disc-type water meters are described in a new bulletin, M-975-B34, issued by the Worthington-Gamon Meter Company, Harrison, N. J. These units conform to the standard specifications for cold-water meters adopted by the American Water Works and New England Water Works Associations. They are available with registers indicating gallons, cubic feet, or metric measure, and are arranged for either circular or straight reading. special feature of the straight-reading register is the rubber-bushed pinion shaft, which prevents metal-to-metal contact. The casings are made from a bronze composition with a high copper content, which makes the meters par-ticularly adapted for water works service under all conditions. The bulletin may be had upon request to the manufacturer.

#### Air-Conditioning Costs

A recently published booklet is entitled "Consolidated Odor Adsorbers in Air Conditioning." This booklet covers the question of cost of operating an airconditioning system. The large savings which can be effected by the use of Odor Absorbers because of the reduction in the amount of fresh "make-up" air are outlined. A set of tables showing these savings for various air volumes is included.

#### New Hand Book

"Magnetic Hand Book" is the title of a new loose-leaf manual issued by the Stearns Magnetic Mfg. Co., Milwaukee, Wis. This new book was compiled in answer to the demand for a standardized catalog containing technical data, illustrations and description of the various phases of magnetic engineering and is a comprehensive survey of the subject. In the section devoted to magnetic separation, the separation, concentration and purification of ores, minerals, sands, food stuffs, grain and numerous other classes of material, pottery and porcelain slip, pulverized clay; protection of crushers, grinders and pulverizers, and the different processes of wet and dry magnetic treatment are a few of the subjects covered in this book.

This company also announces Bulletin "DH" describing a recently developed drum-type magnetic separator for purifying dry pulverized material, applying particularly to operations where the elimination of iron or iron bearings minerals is absolutely essential. Bulletin describes "DH" unit with illustration and drawing.

#### New Bulletin

Safety Mining Company, 307 North Michigan Avenue, Chicago, has just issued a new bulletin, which outlines some of the advantages of Cardox. They assert that it increases realization through the production of a maximum of coarse and a minimum of fine sizes; preserves the inherent structure of the coal; rolls coal forward from the working face; facilitates removal of impurities at the working face through the production of coarser coal; eliminates idle time of men and equipment through the absence of smoke and fumes, thus concentrating the working area; lowers production costs through concentration of output and reduction of necessary haulage, ventilation, supervision, and miscellaneous supplies; consistent uniformity in sizes through elimination of overshooting: reduces output of excessive fines through the low pressure expanding force being concentrated at the back of the drill hole; squares up the ribs and face better, eliminating the hazard of overhanging coal.

#### New Vibrating Screen

Allis - Chalmers Manufacturing Company, Milwaukee, Wis., announces putting on the market a positive electromagnetic vibrating screen using an entirely new principle in which standard alternating current may be used without resorting to expensive auxiliary equipment, such as motor generator sets. A new type of electro-magnetic vibrating motor, properly applied mechanically to the screen, gets its power for operation through a small rectifier mounted on the wall, together with a small auto trans-



former and an amplitude adjusting switch for regulating the intensity of vibration.

This new "Utah" vibrating screen is particularly adapted for screens having openings of ½ in. or less, either wet or dry. Standard screens are made 25, 50, or 60 cycles, 440 volts, the high frequencies being most satisfactory for fine screening. They may be had in open or closed types, with screens for different applications. The open type is available in effective screen area sizes of 4 by 6 ft. and 4 by 7 ft.



#### Stainless Steel

Putting another notch in its evergrowing list of new applications, stainless steel is being used for the blade of a new kind of shovel manufactured by the Ames-Baldwin-Wyoming Company, of Parkersburg, W. Va. The shovels are designed for use wherever chemicals or chemically treated products are handled. They also are recommended in the handling of coal and coke that has been sprayed with calcium to keep dust at a minimum. Armco 18-8 hot rolled strip pickled stainless steel, manufactured by the American Rolling Mill Company, Middletown, Ohio, is being used. Three types of shovels, all with No. 2-B finish stainless, are offered by the company. They include hollow-back round and square point stainless shovels.

#### General Electric Sales Increase

Gerard Swope, president of General Electric Company, announces that orders received during the first two months of 1937 amounted to \$64,000,000, an increase of 79 percent over the corresponding period last year, and that sales billed in the first two months were \$45,000,000, an increase of 39 percent over the same period last year.

The directors, on March 9, declared a dividend of 40 cents a share for the first quarter, payable on April 26, 1937, to stockholders of record on March 19, 1937.

#### Lubrication Booklet

Shell Petroleum Corporation, Shell Building, St. Louis, Mo., has issued a series of booklets entitled "Panorama of Lubrication."

# From the President Down . . .



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